

**Wetland
Action**



**WETLANDS
INTERNATIONAL**



**Self Help
Africa**

North Luangwa Wildlife Conservation & Community Development Programme



Striking a Balance (SAB): Maintaining Seasonal Wetlands & their Livelihood Contributions in central Southern Africa

**Proceedings of a
Lessons Learning and Advocacy Workshop**

**Edited by
Mukelabayi Ndiyoi and Adrian Wood**



**The SAB Project is implemented in Malawi and Zambia
by
Wetland Action, Self Help Africa, FAIR, MALEZA and NLWCCDP**

Lusaka, Zambia

October 2008

The SAB project is a demonstration project of the Wetlands and Poverty Reduction Project of Wetlands International and it is carried out with financial support from Wetlands International under its Wetlands and Poverty Reduction Project financed by the Dutch Ministry of Foreign Affairs (DGIS).

Contents	Page
Table of Contents	i
Acronyms	iii
Executive Summary	v
1. Background	7
2. The Striking A Balance Project	8
2.1 Workshop Justification	8
2.2 Objective of the Workshop	9
2.3 Workshop Approach and Programme	9
3. Workshop Proceedings	10
3.1 Opening Remarks by the Country Director	10
Harvest Help	
3.2 Keynote Address: Striking A Balance	13
3.3 Specific cases of interventions in wetlands for agriculture and other livelihood	17
3.4 Policy development relating to wetland management for agriculture and other livelihood purposes	47
4. Questions and Discussions	65
4.1 Session 1: Dambo Utilisation	65
4.2 Session 2: Policy – Revitalisation	68
5. Report back by Group Work	70
5.1 Experiences and lessons on wetland utilisation and conservation	70
5.2 Technical requirements for wetland management	72
5.3 Policy related issues	73
5.4 Network on wetlands	75

6. Outputs and Next Steps	77
Contact Details	78

ACRONYMS

ADC	Area Development Committee
AU/NEPAD	African Union's New Partnership for Africa's Development
BRE	Barotse Royal Establishment
CA	Comprehensive Assessment of Water Management in Agriculture
CAADP	Comprehensive African Agricultural Development Programme
CBNRM	Community based natural resource management
CBO	Community based organisation
CBPP	Contagious Bovine Pleuro-Pneumonia
COMESA	Common Market for Eastern and Southern Africa
CSO	Central Statistical office
DACOs	District Agricultural Coordinators
DDMC	District Disaster Management Committees
DFA	District Farmers Associations
	Department of Fisheries, Ministry of Agriculture and Fisheries, Zambia
DOF	
EC	European Commission
ECZ	Environmental Council of Zambia (ECZ), Zambia
EIA	Environmental Impact Assessment
FAO	United Nation's Food and Agricultural Organization
FNDP	Fifth National Development Plan
FNDP	Fifth National Development Plan
HH	Harvest Help – now Self Help Africa
GRZ	Government of the Republic of Zambia
IDE	International Development Enterprise
IFAD	International Fund for Agricultural Development
IIS	Integrated Irrigation Systems
IK	indigenous knowledge
INGO	International Non-Governmental Organization
IPM	Integrated Pest Management
JICA	Japanese International Cooperation Agency
LoA	Letter of Agreement
M&E	Monitoring and Evaluation
MA	Millennium Ecosystem Assessment
MACO	Ministry of Agriculture and Cooperatives
MALEZA	Malawi Enterprise Zones Association
MCDSS	Ministry of Community Development and Social Services
MDGs	Millennium Development Goals
MEWD	Ministry of Energy and Water Development
MFNP	Ministry of Finance and National Planning
MTENR	Ministry of Tourism, Environment and Natural Resources
NAP	National Agricultural Policy

NEMA	National Environmental Management Authority (in Kenya)
NEPAD	New Partnership for Africa's Development
NGO	Non Governmental Organisation
NLWCCDP	North Luangwa Wildlife Conservation and Community Development Programme
NORAD	Norwegian Agency for Development
OPV	Open Pollinated Varieties
PACOs	Provincial Agricultural Coordinators
PAM	Programme Against Malnutrition
PAO)	Principal Agriculture Officer
PCLUP	Participatory Community Land Use Planning
PLARD	Programme for Luapula Agriculture and Rural Development
PSRP	Poverty Reduction Strategy Paper
R&E	Research and Extension
SAB	Striking a Balance Project
SADC	Southern African Development Community
SDMC	Satellite Disaster Management Committees
SEA	Strategic Environmental Assessment
SHA	Self Help Africa, Zambia
SIDA	Swedish International Development Agency
SIWUP	Smallholder Irrigation and Water Use Programme
SPFS	Special Programme for Food Security
TA	Traditional Authority
TP	Treadle Pump
TSB	Technical Services Branch
UNNP	United Nations Development Programme
UNZA	University of Zambia
USAID	United States Agency for International Development
VAC	Vulnerability Assessment Committee
VDC	Village Development Committee
VNRMC	Village Natural Resource Management Committee
WCS	Wildlife Conservation Society
WFP	World Food Programme of the UN
WI-DPTG	Wetlands International – Demo Projects Task Group
WWF	World-wide Fund for Nature
ZARI	Zambian Agricultural Research Institute
ZAWA	Zambia Wildlife Authority
ZESCO	Zambia Electricity Supply Company

Executive Summary

Purpose and Orientation

With the increasing use of wetlands for livelihood benefits, especially agriculture, and the limited guidance on how to sustain this use, matching livelihood needs and environmental functioning, the Striking a Balance (SAB) Project was developed to try to address this experience at two levels: field management practices (and associated institutional development) and policy support.

This workshop was called to provide an opportunity for all government, NGO and multilateral agencies involved in wetland management, for development and conservation goals to share their experience and identify ways in which the work should be taken forward.

Most of the relevant agencies participated but some key ones were not able to come and share their experience, most critically the progress with the draft National Wetland Programme.

Papers and Key issues

Six papers were presented which covered primarily the experience with wetland use for livelihood benefits. These were mostly from the NGOs who are working with relief and development activities and for whom wetlands have been initially seen as a critical resource for quick food production in the dry season after the failure of rain-fed harvests. However, increasingly these NGOs have seen that wetlands can be part of a long-term development strategy with their contributions to water supply, crafts, livestock grazing and fishing as well as crop production. This has led the NGOs to take a more developmental, rather than relief view of wetlands, and to begin to consider the need for environmental sensitivity with respect to wetlands. The experience of wetland conservation per se was presented by WWF in the absence of ZAWA. Other NGOs, especially those involved in the SAB project also discussed the need for conservation or sustainable management of wetlands. The stress here was on the need to understand the communities and to work with them to ensure that conservation measures fit with the livelihood needs of the communities.

Two papers were presented on wetland policy from the experience of the Irrigation Department in the Ministry of Agriculture and Cooperatives and the perspective of FAO. It was unfortunate that ZAWA, which currently has responsibility for the national wetland policy was unable to attend and present the progress to date with this policy. The two presented papers stressed how specific production oriented policies and projects need to link to other policies relating to environmental management in order to ensure long term production sustainability. Hence the SAB ideas and initiative to draw policy makers and wetland users together was supported.

Discussion Group Points

Three discussion groups were held which focused on the experience and lessons on wetland

utilisation and conservation, technical requirements for sustainable wetland management, policy related issue and networking. They concluded on the need to:

- Get all the stakeholders together to share their perspectives,
- Improve the input from the conservation and ecological perspective into wetland management,
- Get the wetland policy drafted and circulated for comment amongst all stakeholders,
- Develop a network to keep stakeholder aware of developments and sharing information.

Ways Ahead

The meeting concluded that it is critical for communication and networking to be developed further amongst the parties present at this meeting and for the key conservation organisations, such as ZAWA, to engage in this as well. Specific actions identified were as follows:

1. A lessons learning report of experiences with wetland utilisation from those actors present at the meeting and the review of experiences and lessons should be produced, leading to recommendations for future actions, specifically in:
 - a. Identification of technical areas where actors may require additional support and inputs and exploration of potential ways to achieve this; sharing existing standards and models and good practice both in relation to processes (at different levels – community, local / regional and national levels)
 - b. Identification of policy related issues which may require further consideration in order to explore how policy development can assist achieve sustainable wetland management; and
2. Consideration of the establishment of regular exchange of experiences and ideas through an informal network of interested parties.

This report is a response to the first of these recommended actions.

1. Background

The value of wetlands for rural livelihoods, especially food security, has been increasingly recognised in Zambia since the early 1990s. This is because of droughts, pressures to increase rural incomes, and also because of problems with upland harvests caused by fertiliser shortages and soil degradation. All these factors have encouraged farmers to look for new sites where the soil is better, moisture levels are favourable and crops can yield well. Wetlands also offer a diverse range of other non-food products which can contribute to people's livelihoods, while wetlands can provide important environmental functions, mostly notably in flood control and groundwater recharge (for wells and springs).

Because of the central role agriculture must play in Africa's battle to eradicate poverty and hunger, the African Union's New Partnership for Africa's Development (AU/NEPAD) has placed top priority on agricultural development, challenging African governments to boost budgetary allocations for agriculture to 10% of total spending, up from their current level of 6%. Through the Comprehensive African Agricultural Development Programme, adopted in 2003 by African Heads of State and Government at the AU Summit in Maputo, AU/NEPAD has provided an Africa vision and strategic framework for boosting agricultural productivity and growth. CAADP provides a strategic framework aimed at increasing agriculture growth to at least six percent per year, thereby enabling income growth and wealth creation sufficient to reduce poverty by 50% by 2015.

Four specific pillars for improving Africa's agriculture are outlined by the programme:

1. Extending the area under sustainable land management and reliable water control systems;
2. Improving rural infrastructure and trade related capacities for market accesses;
3. Increasing food supply, reducing hunger, and improving responses to food emergency crises; and
4. Improving agriculture research, technology dissemination and adoption.

The use of wetlands is especially relevant to the first and third of the above pillars, while the fourth is also relevant to the achievement of sustainable use of wetlands to achieve these goals.

The Zambian government has acknowledged that wetlands have a considerable development potential, especially for agriculture. Various irrigation initiatives have therefore been introduced to increase the utilisation of wetlands mostly for winter farming. However, efforts to use wetlands to improve livelihood benefits from them have focused on increasing production and on the development of appropriate technologies. The question of sustaining production, in what are widely regarded as fragile environments, has received little attention. Moreover, the implication of wetland cultivation and the risks on the wetland ecosystems are rarely recognized. Furthermore, the actual role of communities in sustaining wetland ecosystems and

the relationship between people and wetland ecosystems are often not understood by those initiating programs to utilize wetlands for people's livelihoods. In addition, there is as yet no national wetland policy to guide the management of these areas and balance the various demands being placed on them.

It is however acknowledged that the prevailing circumstances will continue to force people to use wetlands even if it means degrading them. It is therefore important that efforts should be identified now to seek ways which can ensure a balance between wetland utilization and conservation so that wetland ecosystems can continue to provide the full range of services to people. This is what is commonly referred to as sustainable use of wetlands. It is acknowledged that there are many things that should be done to ensure that there is balance between utilization and conservation, and one is to engage in technical and policy debates on how to best manage and regulate activities in wetlands.

2. The Striking a Balance Project

During the last two years Harvest Help has been working with funding from the Wetlands International, and collaborating with Wetland Action to explore ways in which wetlands can be used sustainably to meet livelihood needs. Through this "Striking a Balance (SAB) Project" an attempt has been made to bridge the gap between conservation views of wetlands and narrow production-orientated approaches, in other words it has sought to "strike a balance". This emphasis comes from the belief that if wetlands can be managed carefully, and the functioning of their catchments can be maintained, these areas can be productive in sustainable way. If this is achieved, wetlands can help to meet food security and livelihood development needs, while also ensuring environmental functions are maintained for local and wider benefits.

The SAB Project has been operating in the Northern Province of Zambia, in Mpika District, with the North Luangwa Wildlife Conservation and Community Development Programme, and also with MALEZA in the Simlemba area of Kasungu District in Central Malawi. These are contrasting areas, the former with acidic soils, high rainfall, and wide, sparsely used dambos, while the latter has conditions similar to Central and Southern Zambia, with less extensive wetland valleys in a lower rainfall environment and with more intensive use.

Part of this project's work has been to identify other agencies who are working on wetlands for livelihood and environmental benefits, and a network of key interested organisations has been built up. Through this network we hope to exchange experiences and build up a common understanding of how best to manage wetlands for these dual purposes. This must involve technical practices of land management, as well as institutional developments for coordinating activities in wetlands and their catchments.

2.1 Workshop Justification

Building on this project work, it was seen as mutually beneficial to initiate **dialogue and experience sharing on the sustainable use of wetlands**. There were a number of specific reasons for this including the following:

- First, there are a number of actors involved in this area of work, undertaking practical activities on the ground and presumably learning lessons as they go along. From this comes the potential for enhanced learning through the sharing of experiences.
- Secondly, the fact that there are a number of actors means that there is a range of approaches to wetland utilization, as well as a number of technical issues which need to be known and shared. Some of the approaches and techniques are detrimental to wetlands, while others are good. Hence, there is a need to start screening the techniques using the various experiences. Moreover, the fact that there are many actors implies that there is a possibility to create links that can be beneficial to either Government or non-state actors, or both.
- Thirdly, there is **no wetland policy in Zambia** and at present different policies influence wetland management and the sustainable use of these areas. This means that there is need to start a discussion and lobbying in order to harmonize the different policies.

2.2 Objective of the Workshop

The specific objectives of this one day workshop were:

- To bring together agencies working in wetland utilisation to exchange experiences of their work and identify common lessons which have been learned so far.
- To identify issues / problems that could be explored through sharing experiences and specific initiatives.
- To explore what further activities could be developed which will assist actors in terms of practical technical measures as well as policy development.
- To initiate networking around sustainable use of wetlands.
- To identify opportunities for influencing government and NGO policies to achieve the sustainable use of wetlands

2.3 Workshop Approach and Programme

The meeting was open to all government and NGO agencies who wished to share their experiences through brief presentations. After presentations, breakout discussion groups were established on key themes and their deliberations summarised in the final plenary session in which potential ways were agreed.

The Concept Notes circulated in advance to participants gave the overall rationale for the workshop and explained the output which the workshop sought. The outputs sought included some agreement on the issues which are faced in achieving sustainable wetland management for livelihood development, especially with agriculture, and the guidance which the workshop could give or which it thought was needed in this area. Papers were sought on two main themes namely *policy development relating to wetland management or on specific cases of intervention in*

wetlands for agriculture and other livelihood purposes. The papers gave some contextual back ground such as a brief history of organization's involvement with wetland use - how it came about, purpose / rationale, location of activities, scale of activities, beneficiaries and budgets, methods, overall achievements, as well as any evolution in the organisation's approach / policy. Some papers examined interaction of wetland agriculture with other uses of wetland, or other livelihood activities, for example – upland or off-farm activities, time and space competition, and asset accumulation for other enterprises. The relationship of wetland agriculture and wetland flooding regime to upland fields and the state of catchment was also covered in some papers, with ideas raised about how to sustain wetlands for multiple use – at least agriculture, domestic water and flood control.

3. Workshop Proceedings

3.1 – Opening Remarks by the Country Director – Harvest Help / Self Help Africa

Tadeyo Shaba, Country Director, Harvest Help UK / Self Help Africa

The Master of Ceremonies
The Director Wetland Action
Trustee of SHA
Distinguished Participants,
Ladies and Gentlemen,

On behalf of Harvest Help, and indeed on my on behalf, it is a privilege and honour to welcome you all to Cresta Golf View Hotel in Lusaka for a Lessons Learning workshop organised by Striking a Balance Project.

This workshop is an important and very timely workshop. It is a rare and unique opportunity for key stakeholders and actors working in the field of wetland utilisation in Zambia to come together and exchange experiences and lessons.

Before I go far in making my opening remarks,

I want to recognise the presence in our midst of members of the DEMO Projects Technical Advisory Group. We have from England Mike Ousted and from Kenya Violet Matiru. Also in our midst are colleagues from our sister project in neighbouring Malawi.

To all our esteemed international guests, I would like to extend a very special warm welcome. I trust that you will find your visit to Zambia both enjoyable and pleasant. Welcome to Zambia, the real Africa. Do take out some time to visit some of the attractive and popular tourist destinations we have in our nation. We have some of

the best intact wildlife sanctuaries on the continent and rich biodiversity, including impressive wetlands of international significance. Zambia is home to one of the natural wonders on planet earth, the Victoria Falls on mighty Zambezi.

There is an incredible network of rivers, water basins and catchments supporting thousands of rural communities and farmers. Apart from the mighty Zambezi, we have the Kafue and Luangwa ecosystems.

Wetland ecosystems are the focus of this particular workshop.

During the last two years Harvest Help (now called SHA) has been working with funding from the Wetlands International, and in collaboration with Wetland Action and the North Luangwa Wildlife Conservation and Community Developments Programme to explore ways in which wetlands can be used sustainably to meet livelihood needs.

The value of wetlands for rural livelihoods, especially food security, has been increasingly recognised in Zambia since the early 1990s. This is because of droughts, pressures to increase rural incomes, and also because of problems with upland harvests caused by fertiliser shortages and soil degradation.

All these factors have encouraged farmers to look for new sites where the soil is better, moisture levels are favourable and crops can yield well. Dambos and Wetlands offer a diverse range of other non-food products which can contribute to people's livelihoods. On the other hand, wetlands provide important environmental functions, notably in flood control and groundwater recharge (for wells and springs).

The Striking a Balance Project has sought to bridge the gap between conservation views of wetlands and narrow production-orientated approaches.

The belief is that if wetlands can be managed carefully, and the functioning of their catchments can be maintained, these areas can be productive in sustainable manner. As HH (now SHA) we embrace the philosophy of environmental stewardship. We see wetlands helping in meeting food security and livelihood development needs, while at the same time ensuring environmental functions are maintained for local and wider benefits.

As SHA we champion innovative and practical solutions in sustainable use of natural resources. We want to ensure that there are direct utilitarian benefits to farmers as they make use of natural resources. We also endeavour that farmers as custodians of the natural resource base and biodiversity, do not degrade the very substrate and foundation that supports their livelihoods. We are advocates of sound developmental approaches.

Mr Master of Ceremonies, I am quite aware that in saying this it is akin to talking to the converted. Nonetheless, allow me to flag just a few challenges which as SHA we feel this distinguish grouping should bear in mind as you deliberate.

The United Nations Environment Programme predicted that the only continent on which poverty will deepen in the 21st Century will be in Africa. Just like the negative impact HIV/AIDS would have on society, it is perceived that any human developmental endeavours would suffer serious set-backs, resulting in reversal of any gains made.

The United Nations Development Programme's Human Development Report has warned that the world should focus on the development impact of climate change that could bring unprecedented reversals in poverty reduction. Climate shocks such as droughts and floods, which will become more frequent and intense with climate change, are already among the most powerful drivers of poverty and inequality—and global warming will strengthen the impacts.

Mr Master of Ceremonies, we need to quickly understand the negative impact that climate may have on agricultural systems in our countries and what measures can be used to mitigate such effects.

Analysis of the impacts of climate change by NEPAD suggests that agro-ecological systems are the most vulnerable sectors. Agriculture in our countries is expected to be especially vulnerable because climates are already too hot. Further warming is consequently expected to reduce crop productivity adversely. These effects are exacerbated by the fact that agriculture and agro-ecological systems are especially prominent in the economies of African countries and the systems tend to be less capital and technology intensive.

As Harvest Help, we are aware that the impact of these adverse climate changes on agriculture is exacerbated in Africa by the lack of adapting strategies, which are increasingly limited due to the lack of institutional, economic and financial capacity to support such actions.

The breakdown of agricultural systems, as a result of increased exposure to drought, rising temperatures and more erratic rainfall, will leave thousands of farmers more vulnerable in the years to come. It is in this vein that we at SHA take a vested and keen interest in the SAB project and in today's workshop.

We believe that collectively we can achieve more. Let us continue to dialogue as agencies and as practitioners in our quest to finding solutions to the many developmental challenges and as we strive to help masses get out of the poverty trap.

I wish you a productive and successful workshop process as you exchange experiences and seek to identify processes that could be explored further.

Mr Master of Ceremonies, with these remarks, I declare the 2008 National stakeholder Workshop on Lesson Learning under the SAB project officially open.

Thank you for your attention and May God Bless you All!

3.2 Keynote Address: Striking a Balance: maintaining seasonal wetlands and their livelihood contributions in central Southern Africa

Mukelabai Ndiyoi and Adrian Wood

3.2.1 The Evolving Wetlands Agenda

The global agenda on wetlands is changing. For much of the last half century, the dominant concern was for the conservation of wetlands as natural areas, pristine and unspoiled by human intervention. The Ramsar Convention on Wetlands (1971) while originally supporting this conservationist view began to introduce some changes from the late 1980s with ideas about the need for “wise use” of wetlands. This type of use was generally interpreted as permitting limited harvesting / collection of natural products from wetlands without any alteration of their natural state. The growing concerns about poverty and the formulation of the Millennium Development Goals (MDGs) (UNDP, 2000) which included emphasis upon poverty reduction and ensuring environmental sustainability, started new discussions about how to achieve the sustainable use of wetlands for livelihood benefits. In particular, the role of wetlands in contributing to health goals through safe water and to food and livelihoods has grown as a result of the MDGs.

Understanding of the contribution of wetlands to livelihoods in different ways was further enhanced by the Millennium Ecosystem Assessment (MA, 2006), which recognised the range of ecosystem services wetlands provide – provisioning services, regulating services, cultural services and supporting services. The MA has led to wetlands being increasingly recognised for their wider environmental roles. These include the regulation of stream and river flow, the reduction in flooding and the maintenance of dry season flows, and the recharged of groundwater supplies and maintenance of springs. In particular, with increasingly degraded and altered (non-natural) catchments leading to rapid runoff and damaging floods, wetlands are seen to be increasingly important for attenuating flows and protecting infrastructure.

3.2.2 Threats to Wetlands and Potential Conflicts

While wetlands are important in many countries in the developing world because of their livelihood contributions, and have an importance well beyond their size (usually around 2% of the surface area), they are fragile areas which can easily be degraded. The MA pointed this out and showed that wetlands are one of the ecosystems most threatened by recent development pressures. This view was confirmed by the CA Report from the International Water Management Institute (CA, 2008) which predicted greatly increased pressures on wetlands in the coming four decades as a result of population growth and growing demands for food. These pressures will be increased by climate change in many parts of the world, and also by degradation of upland farming areas and by the increase in fertiliser prices, all of which will tend to negatively impact upon upland rain-fed farming.

Recognition of this growing pressure on wetlands has led the Ramsar Convention to develop with FAO a global initiative, entitled Guidelines on Wetland and Agriculture

Interactions, to try to explore how wetlands can be used in sustainable ways. Within the Southern Africa region SADC has started to develop initiatives to raise awareness of the importance of wetlands, especially for water resource management, while COMESA's work on food security has seen most member countries develop food security policies which include the use of wetlands in one way or another. In the latter case wetlands are seen as very important because of the secure harvests which they can provide, especially because this can be achieved in the dry season when food is becoming scarce, and because wetlands can provide fertile soil which needs little fertiliser.

Specific threats to wetlands are seen in different forms in different parts of the world. In southern Africa these are often found in various aspects of landscape change and poor agriculture. Gully formation in wetlands lowers the water table and causes them to lose their ability to store water. Various theories have been proposed to explain this, but one is the increased runoff from degraded catchments which lead to increased stream peak flow. Land use change within wetlands, especially the loss of natural vegetation through intensive grazing, excessive harvesting of reeds and cultivation in the centre of wetlands are also thought to contribute to this problem. Degraded catchments can also lead to the deposition of sandy sediments in wetlands which altered the soil quality and the vegetation. In addition, poor infiltration into the soil and subsoil in degraded catchments can lead to reduced storage of water and sub-soil flow of water into wetlands which can help recharge them in the dry season and maintain their wetland characteristics all year-round.

The degradation of wetlands and their development for agriculture can lead to various sorts of conflict within communities using these areas. Where the water table is lowered on purpose to facilitate cultivation or as a result of gullying, water supply from springs and shallow wells can be jeopardised. Similarly, the development of wetlands for cropping can negatively affect other users of these areas such as livestock keepers, crafts people, and those collecting medicinal plants and other wild produce. In some cases there are dangers of social divides being created as those households with more resources appropriate (privatise) the formerly open access (communal) wetlands for their own agricultural development, leaving the less well off, the poor and the sick with limited access to these areas which are potentially critical for them.

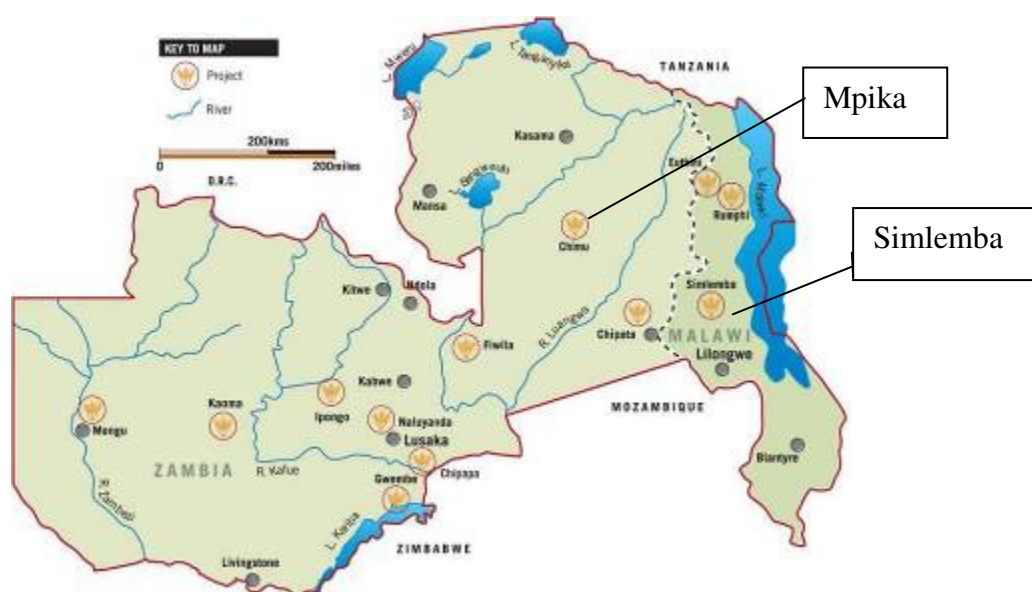
3.2.3 Wetlands and Poverty Reduction Project

Wetlands International, a long term wetland conservation organisation, with a particular well-established record in wetland bird conservation, has also been involved in the changing agenda, outlined above. Recognising the neglect of wetlands in the Poverty Reduction Strategy Papers of the early part of this century, it developed its Wetlands and Poverty Reduction Project with a variety of training and demonstration elements in order to raise awareness and understanding of the role of wetlands. As well as four training modules on various aspects of wetlands (www.wetlands.org) it selected from partners five demonstration projects through

which poverty reduction could be explored through enhanced wetland management. The project which is hosting this workshop is one those demonstration projects.

3.2.4 Striking a Balance

The Striking a Balance (SAB) demonstration project was developed by Wetland Action and Harvest Help (now Self Help Africa) with local partners and Zambia and Malawi, respectively the North Luangwa Wildlife Conservation and Community Development Programme (NLWCCDP) and the Malawi Enterprise Zones Association (MALEZA). The project builds on existing work in the Mpika area of Zambia and Simlemba area of Kasungu District in Malawi, where wetlands are part of existing livelihood projects.



Harvest Help Projects in Zambia and Malawi

The key additions which the SAB has sought to emphasize the functional landscape approach, the need for the development of an appropriate technical package for wetlands and the importance of a favourable policy environment to ensure sustainable and long term use. The functional landscape approach places particular emphasis on the need for good land management in the farmed and woodland areas in the catchments in order to prevent flash flooding which can contribute to gully formation and deposit sandy sediments in wetlands. Further the functional landscape approach stresses the need for improved water infiltration in the catchment to improve water storage for the wetlands. This approach also stresses the need for good management of the wetland, with natural vegetation maintained in key areas, especially in the centre of the wetland, so as to reduce the risk of gully formation and rapid flood surges. Efficient water management is also stressed at the micro level through careful use of treadle pumps, and water saving methods in the cultivated areas with depression beds and mulches used.

On the social side, the SAB project recognises the importance of community development and enhanced understanding of wetland functioning. Community agricultural facilitators are trained in each community who can lead in this process. In particular they have to help the community develop a Village Natural Resource Management Committee (VNRMC) which can develop bye-laws to ensure sound wetland and catchment management. The VNRMC is responsible for enforcing the bye-laws, with the support of the village headman and area chief, and for developing an overall land use plan for the community lands to ensure the sustainable use of wetlands and uplands for livelihood benefits.

3.2.5 Workshop Objectives

The SAB project has invited you all to this workshop because we all have a common interest – the sustainable use of wetlands. SAB tries to strike a balance between conservation and utilisation of wetlands, a very challenging issue as population grows and demands for food increase. Some of you have experience in wetland use for cropping, grazing and the collection of natural products. Others of you have experience of conservation of wetlands, often involving the local communities. Together it is hoped that we can share our experience in order to learn more about how to strike that balance we need for sustainable wetland use. In particular, the meeting seeks to:

- Review experience of wetland use and management in Zambia;
- Assess threats to continued wetland functioning and their livelihood contributions;
- Assess the relevance of different measures for sustainable wetland management;
- Identify lesson and challenges for sustainable wetland management;
- Identify policy issues which should be addressed to create favourable conditions for sustainable wetland use and conservation; and
- Propose ways forward, including prioritising issues and identifying networking activities.

We hope that this is a productive day and can contribute significantly to ensuring the heritage of valuable wetlands supporting livelihoods, contributing to the MDGs and supporting environmental functioning can be ensured for future generations.

3.3 Specific cases of interventions in wetlands for agriculture and other livelihood

Paper 1. Striking-a-Balance Demo Project in Mpika District, Zambia – Sharing Lessons On Sustainable Wetland Utilisation

Jonas Sampa and Ernest Cheepa,
North Luangwa Wildlife Conservation and Community Development Programme

1. Introduction

The CHIMU Rural Livelihoods Project began in 2004 with the goal of improving the well-being of communities in part of Mpika District of Northern Province, through the development of enhanced and sustainable livelihood activities. In 2006 an additional element was added as part of the Striking a Balance Project. This sought to support the existing work on wetland use for cultivation with a focus on making this sustainable and environmentally sensitive.

2. Project Development

Three communities were chosen in which the SAB work is piloted. These are Mushishe, Mwansabambwa and Chikakala, with a total population of some 570 households. In the first two sites wetland cultivation was relatively new, having started with the Chimu Project, but in Chikakala wetland cultivation had been established for four or more years. In all sites wetland cultivation was following a new method developed by Jonas Sampa and supported by NLWCCDP in the Chimu Project. This involves an adjustment to the traditional burning of wetlands in dry years to use for cultivation to supplement poor upland harvests. (This method is described in detail in the Technical Guide produced by the SAB Project. A summary is provided in the text below)

The specific goals of the SAB part of the Chimu Project have included:

- Promotion of the functional landscape approach to ensure the supply of water to the wetlands;
- Dissemination of sustainable wetland use technologies for livelihood enhancement;
- Development of local institutions for managing wetlands and their catchments;
- Promotion of local learning networks for exchanging experience; and
- Contribution of field experience for policy development.

3. Field Activities

The interactive training which has been undertaken with the communities has been a two-way learning process. This has involved both the project staff and the communities developing a much deeper understanding of how the wetlands operate and the ways in which catchment management and land use affects the availability of water in the wetlands.

a) Resource Mapping and Site Selection

The Project has worked closely with the communities to enhance their ability to assess their wetlands and identify appropriate sites for cultivation. These sites are ones which are always moist, but not subject to flooding. They are found some way down from the wetland edge but well upslope from the stream and dambo centre. In most cases there are vegetation indicators which identify these sites, with a particular short sedge-like vegetation covering such areas.

b) Ridging and Burning Techniques

A series of steps in the creation of ridges for cultivation have been developed and training on this is provided. These steps include the cutting of shallow turves, drying them grass side down across all of a plot (to help avoid water loss from the plot), ridging and burning followed by re-ridging and planting.

c) Wetland Land Use

The alignment of ridges is an issue of importance as they need to avoid encouraging erosion but must also not cause the build up of water. This needs careful training and assessment of slopes.

A further set of wetland use considerations have been developed including the protection of the centre and head of the dambo from cultivation, as well as the location of garden not close to the edge of the dambo.

d) Crop Rotations

Once the ridges have been prepared a system of crop rotation can be practised which means that three or four crops can be grown successively before the land has to be fallowed. Experiments on this over the years have found that the following is a good succession.

Table 1: Dambo Cropping Calendar for Food Security and Cash Needs

Months	Food Security Crops	Cash Income & Food Crops
July/Sept – Oct / March	Maize	Tomato, Onion & Squash
March - June		Cabbage
July – Sept/Oct	Beans	Beans
Oct - Feb	Maize	Maize

e) Manure Tea and Organic Fertilisers

While the dambos are inherently fertile once they have been burned, the intensive cropping as show in Table 1 draws heavily on the soil nutrients. As a result the use of organic manures and liquid fertiliser or ‘tea’ are recommended.

f) Catchment Management

A key aspect of the SAB work has been to help NLWCCDP develop the environmental sustainability part of the wetland management programme they had already developed. This involved an assessment of where the water in the dambos is coming from and how it could be affected positively and negatively. This work led to the

identification of upslope land use at the sides of the dambos as being a key factor in this. Deforestation and the presence of *chiteme* gardens were identified as being associated with reduced water availability in the dambo areas immediately downslope, while undisturbed forest was associated with the plentiful availability of water in the dambo areas adjacent and downslope.

g) Institutions for Natural Resource Management

The work on catchment and wetland land use led to the recognition of the need for formal guidance on land use in the wetlands and their surrounding catchments, as well as the means to enforce such guidance. This led to the development of Village Natural Resource Management Committees (VNRMC) in each pilot site. They have developed bylaws which have been approved by the local Chief and are enforced by the VNRMC with support from the village headmen.

h) Market Field Days

The linking of dambo use with livelihoods has meant that it is important to ensure that crop surplus, in excess of domestic subsistence needs, are sold for a good price. In some case farmers take their produce by bike to Mpika town. However, in order to encourage traders to come to the village to buy the crops the project has organised Market Field Days.

4. Achievements

a) Filling the Food and Income Gap in the Wet Season

Wetlands now play a critical role in the livelihoods in the three pilot site communities. First they have ensured that the wet season is no long a hungry season and the farmers have squashes, onions, tomatoes and green maize which they can use for their food. Further they can sell some of these products and buy food with the cash.

Income generated from the sale of vegetables can quickly exceed that needed for food purchases and so the farm families can address other income needs such as school fees and uniforms which occur at this time of year.

b) Diversifying Farm Enterprises

The development of dambo farming of vegetables means that families are diversifying their sources of food and income which can increase the security of their income and food supply.

c) Asset Accumulation and Livelihood Security

Cash earned from vegetable sales which is in excess of immediate needs can be used to purchase capital items such as a radio, bicycle or farm equipment. These assets can enhance the productive skills of the family and provided increased livelihood security.

d) Market Linkages

There are now strong links between the wetland using communities and the marketers from Mpika town. In some cases the links even extend to the Copperbelt,

with farmers being pro-active and contacting traders when they have produce available.

5. Lessons

The dambos of Northern Province in Zambia are now being recognised for their livelihood potential, especially vegetable cultivation. In order to ensure that these activities do not destroy the dambos it is important that the guidance developed in the SAB part of the CHIMU project is disseminated more widely and that the experience with this guidance is monitored.

Paper 2 Integrated Wetland and Catchment Management for the SAB Project – The Simlemba Experience in Malawi

Patrick Thawe and Harold Msusa, MALEZA

1. Introduction

The Malawi Enterprise Zones Association, MALEZA, promotes rural development by establishing farmers' organisations or different sort, including cooperatives. Other activities include social protection and disaster mitigation, livelihood improvement initiatives, improving nutrition and environment protection activities.

Since 2004 MALEZA has been working with the rural communities of Simlemba TA and from 2005 this support has been organised in the Simlemba Community Initiative for Sustainable Rural Livelihoods (SCISRL) Project. That project has been supported by Self Help Africa through technical and financial assistance provided by FAIR Malawi.

In 2006 the Striking a Balance (SAB) Project was established in Malawi with its field element working through MALEZA to compliment the SCISRL Project. The goal of the SAB element of the SCISRL project is to reduce poverty among wetland-dependant communities in Simlemba through the development and testing of strategies for the sustainable management of seasonal wetlands, especially dambos and small river valleys. Overall the fieldwork and other information exchange activities seek to derive practical wetland management lessons for Malawi and to influence policy at the national level – in government and amongst NGOs, in order to better recognise the role of wetlands in poverty reduction.

The target area for this demonstration project are three pilot communities at Chiotha, Malawira and Katema villages, which are all found within Simlemba Traditional Authority (TA) of Kasungu District. The SAB project has target groups at a variety of levels, including rural communities – especially the poor and local community institutions used for community based natural resource management (CBNRM) and land management and allocation. In total the project is targeting 133 farm households in these three villages.

2. Project Interventions in Simlemba

The focus of the SCISRL Project is to:

- Improve household food and nutrition security by practicing sustainable utilisation of natural resources, including wetlands;
- Meet basic needs as a result of increasing income and assets derived from sustainable income generating enterprises; and
- Increase awareness of HIV/AIDS and local capacity to cope with its negative impacts.

Within this work wetlands have been identified as a key natural resource in the area because of the recurrence of drought, the growth in population and resulting pressure on the uplands, and the need for alternative income sources

The guiding principles for the SAB project are that:

- Community based natural resource management should be participatory;
- an integrated approach should be followed, seeing the links between catchments and wetland as exemplified in the functional landscape; and
- A balance has to be achieved between the environmental functions (regulating and support services) of wetlands and their livelihood benefits (provisioning services).

The approach used in the SAB work focuses on sustaining environmental functioning, sustainable rural livelihoods and local institutional capacity building, with three key areas of work:

- Functional landscape approach;
- Functional local institutional structures; and
- Sustainable livelihood improvement initiatives.

a) Functional Landscape Approach

This approach recognises that the wetlands rely upon water from their catchments in order to function as wetlands. The need for water infiltration into the catchment, rather than rapid surface runoff, is essential for the long term supply of water through the year. Hence good land management in the catchment is vital for sustaining wetland functioning, and the two together make a functional landscape.

b) Functional local institutional structures

Community institution development and capacity building is the major tool of sustaining the project activities. Under the supervision of Area Development Committee (ADC) and Village Development Committee (VDC) a Village Natural Resource Management Committee (VNRMC) has been established. The VNRMC oversees the management of the natural resources in the village, including wetlands.

The VNRMC is at the centre of the activities relating to sustainable wetland management and utilisation through the functional landscape approach. It provides advice to farmers over wetland management, upland afforestation, farm land management and the development of participatory land use planning for all the community's land.

c) Sustainable livelihood improvement initiatives

To ensure sustainability of its work the SAB project seeks to ensure that livelihoods are improved and the value of the benefits obtained from the wetlands is increased. In particular, low cost and economically attractive ways of developing the wetland potential are sought, especially exploring how to achieve higher and more secure crop yields from these areas, as well as other benefits.

3. SAB Field Activities

The following sections provide a summary of the measures being support in different parts of the land belonging to these three pilot communities.

Wetland activities:

- Wetland zoning to protect the centre of the wetland from cultivation and reduce the risks of gully formation.;
- Relocation of shallow wells away from the centre of the wetland to reduce erosion risks– shallow wells dug on the edges of the wetland;
- Improved wetland cultivation techniques:
 - i. Beds for cropping – to use water more efficiently
 - ii. Planting spacing – to improve quality of crops
 - iii. Compost use – to improve soil fertility and water storage;
- Better water management techniques with mulches and care with the plentiful water from treadle pumps;
- Careful selection of crops and plants in wetlands, controlling the sugar cane area and removing eucalyptus trees.

Institutional coordination and capacity building:

- Development of community based structures/institutions e.g. Village Natural Resource Management Committee (VNRMC);
- Formulation of VNRMC byelaws and constitutions, which govern the function of the committee and the actions of farmers - with penalties applied for non-adherence to these rules;
- Appointment of a Community Resource Management Worker/Volunteer (CNRMW) in each community – who should have specific responsibilities for the wetlands, and for soil and water conservation and catchment afforestation, or have strong links with the person responsible for that work;
- Development of capacity building programme as wetland management interventions must be based on skill development and arrangements within the communities to manage wetlands and catchments in a sustainable manner.

Upland activities

- Soil and water conservation in the catchment to improve water infiltration.
- Afforestation of upper slopes to prevent the build up of runoff;
- Use of organic fertiliser to improve soil fertility and structure and thereby improve water infiltration;
- Introduction of agroforestry to help improve upland soil fertility and stability;
- Protection of a zone at the edge of the wetland to prevent erosion wash into the wetland and to ensure infiltration of any upland run-off;
- Development of a land use plan to maximise benefits in upland farming and minimise erosion risks.

4. Overall Achievements

Although the SAB activities have been supporting the SCISRL for only two years a number of key achievements have been reached. These are listed below.

a) Natural Resource Management

- Set up three functioning VNRMC's within the project areas. The VNRMC's have developed detailed village natural resources management plans (VNRMP's) and byelaws, which have been endorsed both by traditional leaders and Kasungu District Assembly;
- Identified and undertaken capacity building of CNRMWs responsible for the wetlands and catchment afforestation;
- Regenerated forests in the upland areas linked to bee keeping for honey production, a good source of income for individual households;
- Progressed towards a functioning landscape within the project area.

b) Livelihood Development

- Diversified production of crops in the wetlands, for households consumption and sale;
- Use of animal waste as one of the ingredients for manure making to improve yields from upland and wetland farming;
- Extension of the crop production period within the wetlands through improved water availability and new crops, thereby bringing a steady food supply and income for families during winter season;
- Through sale of produce from wetlands, farmers are able to buy agricultural inputs for their upland farming;
- Saving and credit groups have been established which support initiatives in different small-scale business ranging from selling crafts, such as mats, to second-hand clothes with members having saving accounts with a commercial bank (Opportunity International Bank of Malawi) from which they can access loans;
- Village savings and credit scheme group members are able to invest and borrow money from money realised from wetland cultivation.

c) Striking a Balance

For the long-term well being of communities, it is essential to maintain the ecological functioning of the wetlands and hence their ecosystem services – both for livelihoods and environmental functioning. Varying degrees of transformation in wetlands need to be accepted in order to meet the economic needs of the communities, but a balance must be achieved which meets the requirements for ecological functioning to ensure sustainability. Above all the wetlands must continue to provide their key functions as stores of water, and sources of fertile land and the various products which communities need. Hence the critical issues in sustainable wetland management are to maintain the water in the wetlands, to avoid erosion / gully formation and soil loss, and to maintain soil fertility.

5. Issues

Some key issues which MALEZA see as needing attention in order to achieve the necessary balance are explained below.

a) Sustainable Environmental Management

There is a need to popularise the functional landscape approach which integrates the environmental conditions in the catchments and their related wetlands at the same time. This should build on the way reduced catchment degradation and enhanced infiltration in the upland areas will not only improve the supply to the wetlands, but will also improve upland crop yields.

Sustainable farming methods, soil and water conservation measures and afforestation all need to be economically attractive if they are to be sustainable. Goat control is an issue and a time consuming effort in order to protect areas being afforested.

Preventing cultivation of the uplands coming right down to the wetlands to ensure that a cordon on natural vegetation surrounds each wetland may require agreement on reallocation of fields. This is essential so that an infiltration zone is created and a barrier to sediment flows from the uplands.

Maintaining, or re-establishing areas of natural vegetation within the wetlands to enhance water storage, reduce erosion risks, facilitate infiltration and prevent large continuous blocks of cultivated land will require coordination and negotiation amongst the wetland users.

These points all show the need for coordination amongst farmers and community-based decision making. Hence they confirm the need for a strong VNRMC.

b) Social Equity and Development issues

Wetland management initiatives should empower all classes of the society with production skills. These skills include crop diversification, sustainable livestock management and small-scale business development. It is essential for community coherence that the use of wetlands is not solely benefitting the better-off in society who would be appropriating the resources which were formerly available to all under open access arrangements.

Communities use natural resources within wetlands as a major economic activity that provides daily cash. As such interventions which seek to achieve sustainable management of these areas, to balance livelihood and environmental services, must ensure that livelihoods are supported and developed if they are to be accepted and have a sustainable impact.

c) Local Management and Institutional arrangements

Wetland management initiatives should build on existing local institutional arrangements, which operate in the villages in order to encourage the application of the proposed approaches. Community-based VNRMC's are essential in order to develop a body of support within the community if difficult decisions have to be made about land use and land allocation arrangements which have to be enforced by traditional leaders.

The growing interest in wetlands suggests that there will be difficult decisions to make in order to control the demand for farm plots in these areas.

d) Training, Capacity Development and Monitoring

Wetland management interventions must develop the skills and arrangements within the communities to manage wetlands and catchments in a sustainable manner.

This should involve the development of the Village Natural Resource Management Committee, but also the appointment of a Community Natural Resource Management Worker (CNRMW) in each community. CNRMW, should have specific responsibilities for the wetlands, and should also be responsible for the catchment afforestation, or have strong links with the person responsible for that work.

e) Income Diversification in Wetlands

There is a need to explore other livelihood benefits based on wetlands which will now lead to such wetland transformation as is the case with cultivation. This could include activities such as bee keeping around the edges of wetlands, the development of crafts based on reed beds, and the enhancement of water supplies from shallow wells. All will encourage communities to keep a mix of land use and the presence of water in their wetlands.

f) Scaling-Up the Functional Landscape Approach

The functional landscape approach works best which the whole of a stream or river valley is managed following the principles of good land management in both the catchment and wetland which it requires. Hence, the SAB work needs to be extended to villages neighbouring the three pilot ones and slowly extended to cover the whole of the catchments and streams in those three locations. Once this is achieved the impacts will increase dramatically.

6. Conclusions

The SAB element within the SCISRL Project has only operated for a short time, some two and a half years. However, it has produced positive experiences and has generated much support within the communities. The relevance of this work to other projects run by MALEZA is clear and the possibility of more widely applying this approach is now being considered.

Paper 3 Experiences in Wetland Utilisation – a PAM Perspective

Paul Kapotwe, Executive Director, Programme Against Malnutrition,

1. Preamble

This is not a technical paper seeking to deal with the technical aspects of wetland access, utilisation and control, or scientific issues relating to ratios of water recharge and discharge, toxicity and other technical effects on the wetland ecosystems. Rather, it is a paper developed to inform interested readers and collaborating partners on PAM's interventions and interface with wetlands in its agricultural programmes.

Apart from outlining the institutional and operational profile of PAM, the paper will outline the various interventions that PAM, in its quest to provide prosperous livelihoods, food and income security support to vulnerable households, provides to communities proximate to wetlands.

The paper will also describe the farming systems and intervention logic employed to undertake winter cropping or wetland cropping and how the component came about. Brief remarks and general comments on experiences in wetland access and utilisation as well as some challenges will also be discussed.

Some talking points for the future will also be spelt out as recommendations for actions on wetlands.

2. What is PAM?

Following the 1991-1992 period when Zambia suffered the worst drought in 100 years, a number of organisations among them the UN system and Government, mobilised support to assist people with food and other humanitarian needs. The Ministry of Agriculture, WFP, the donor community and several local NGOs took part in this disaster emergency relief.

The coordination of these relief efforts was done through an ad-hoc committee called Programme to Prevent Malnutrition (PPM) whose committee was staffed with people from the different institutions and government who took part in disaster relief and emergency activities. This was before the Disaster Management and Mitigation Unit (DMMU) was established under the Office of the Vice President (OVP).

It is this committee which transformed into PAM in 1993 as an NGO with its own full time staff with a strategic plan and a governance structure. PAM is the largest agro-based local NGO, with a large network of local NGOs in all districts in Zambia. PAM targets low capacity households who are termed *vulnerable* because of their resource-poverty but still *viable* because they have the ability to access support and contribute their time and efforts to engage in agriculturally productive lives and thus become self sustaining. PAM networks with the donor community and government,

especially the Ministry of Agriculture and Social Services (MCDSS) and the Ministry of Agriculture and Cooperatives (MACO), in implementing the Food Security Pack Programme (FSP). PAM has also implemented a number of projects and programmes in food security, asset building, emergency and relief, as well as conservation and seed multiplication.

Among the programmes PAM has implemented are:

- Disaster Rehabilitation Project (DRP) – 1991-1992 - funded by World Bank, Sida, Norad, GRZ US \$ 500,000
- Emergency Seed Distribution Programme (ESDP) – 1991-1995 - funded by World Bank, Sida, Norad, GRZ, US \$ 500,000
- Multiplication & Improved Seed & Planting Materials (MDSP) – 1990-2000) funded by Norad, Sida, US \$ 1m
- Small Holder Agriculture Processing, Enterprise and Seeds (SHAPES) 2005-2000), funded by World Bank, US \$ 1m
- Food Security Pack (FSP) – 2000- to date - funded by GRZ through MCDSS, US \$ 5m (*since inception*)
- Community Markets for Conservation –(COMACO) 2005-2008- funded by Royal Norwegian Embassy, US \$ 2.8m
- Enhanced Food Security through Cassava based Farming Systems (EFS-cassava) – (2007-2008) funded by FAO, US \$ 150,000
- Community Health Aids Nutrition Gender & Education Support (CHANGES) – 2006-2007, funded by USAID, US\$ 100,000
- Hunger Stop-gap Emergency (wetland) project – 2005-2007 funded by DFID, GBP 240,000

Since inception PAM has reached up to 620,000 households with inputs for increased agriculture production, trained 30,000 households in food processing extension, conservation farming, entrepreneurship and other services.

Recently PAM has embarked on broadening the staple base and enhancement of income through cassava production, processing and marketing. The organisation has installed a cassava milling plant in Mansa. The plant was kindly donated by WFP and leased to PAM by MACO. In addition other cassava activities have been undertaken through the Acceleration of the Utilisation of Cassava Task force and other international institutions and the University of Zambia. PAM is moving towards market orientated agriculture support with value addition as a critical vanguard.

3. Why a PAM Wetland Programme?

The FSP programme is the largest agricultural programme the government has contracted to an NGO. The programme is a direct response to the government's desire to provide inputs for its small holder farmers especially the rural based farmers whose access to improved seed and agriculture extension was very weak.

The programme provides a diversity of seed inputs and fertiliser for the cultivation of food crops for improved food security nutrition and incomes. The Pack is composed of the following inputs (to cultivate at least 2 limas):

- Cereal seed – 10kg (rice or maize)
- Legume seed – 12.5kg (beans or ground nuts, or cowpeas)
- Root and tuber – 100 cassava cuttings or sweet potato vines
- Fertiliser – 50kg of both D and Urea (as started packs only since extensive use of fertiliser is discouraged in this programme),

Access to FSP inputs is on the precondition that farmers have to be practising the cultivation of these crops. Food processing and preservation, nutrition training, market and cereal bank development as well as alternative livelihoods activities (fish farming, poultry and small livestock promotion) are promoted along side the pack. PAM works through the lead NGOs and CBOs in communities to deliver its programmes.

The cultivation of crops in PAM is based on two components:

Rainfed pack – the full pack described above is what a household receives for rainfed cultivation in a given season. The pack has a diversity of seed to ensure broadened food and income base as well as to conserve soils.

Wetland pack – the wetland pack is targeted at households who are in dambo areas or wetlands and who already cultivate on these wetlands for winter cropping. The usual pack size for wetland cropping is small and is mainly composed on vegetable and cucurbits as a hunger stop gap and connecting agricultural activity. The wetland pack comprises the following:

- Legumes - mainly cow peas up to 5kg
- Vegetable seed – various up to 1kg
- Early maturing maize – up to 5kg
- Fertiliser – at half rate

PAM has implemented wetland cropping for the past 3 seasons, reaching 15,000 households in selected wetland areas. Wetland cropping came about as a response to the diminishing food security levels of the people due to poor yields occasioned by poor soils, low rainfall, excessive rainfall and the need for an increased income generation. Wetland cropping is enabling farmers to practice agriculture throughout the year.

4. Wetland Utilisation

Owing to the fragility of wetlands PAM's interventions in wetland cropping have been driven from two major fronts:

Conservation farming – Beneficiaries of wetland inputs practice conservation farming like pot holing and the use of animal manure. They also rotate crops on wetlands to enrich the soils. Fertiliser is used only for maize as a starter pack, just to boost germination.

Wetland access and management – Beneficiaries use wetland sparingly by intercropping legumes with maize, pumpkins and other vegetables. Beneficiaries also cultivate a certain distance away from the water course by using treadle pumps to lift and pump water to their gardens.

5. Policy Implications

Concerns on wetland access and utilisation have been voiced in many forums not only in Zambia but elsewhere. The ecosystem surrounding these wetlands is threatened by invasive activities that reclaim the wetlands for industry, agriculture and other uses.

Granted, there are conflicting needs that need to be fulfilled and hence the need to “strike a balance” in the interest of wetland protection and preservation. PAM has also realised that there are livelihood and food security needs that may overarch industrial and conservation needs, especially when harvests from the main season have failed and food insecurity is looming.

To address the concerns on wetland access and utilisation PAM facilitated an assessment study by experts from MACO – ZARI and the ECZ. To examine the extent to which wetlands were being exploited through PAM interventions and the level of such utilization, and whether the subject wetlands were ‘under threat’.

The key finding was that the level of exploitation of wetlands by PAM was minimal. In addition the types and levels of inputs provided were too small and short term to warrant destruction of the wetlands in the immediate future.

In endeavoring to retain, protect and preserve wetlands, and thus strike the needed balance, we propose the following Policy and Practice recommendations:

Policy level

- Formulate wetland policies and legislate access and utilization of wetlands;
- Maintain policy dialogue on issues of wetland management and preservation with key stakeholders;
- Engage ECZ, MACO, and other local stakeholders in wetland management and utilization;
- Collaborate and share with international bodies such as Wetlands International in seeking appropriate guidelines and lessons;
- Involve non-state actors in management and monitoring of wetland utilization;
- Strengthen traditional leadership in local and traditional management and protection of wetlands;
- Expand ECZ’s role beyond Environmental Impact Assessment (EIA) to Strategic Environmental Assessment (SEA).

Practice level

- Implement wetland-friendly programs on wetlands. In agriculture, employ tested farming systems and approaches;

- Expand training and farmer capacity building in wetland management;
- Promote conservation farming systems in all wetlands;
- Enhance wetland monitoring to ensure sustainable access and utilization of wetlands;
- Promote wetland cropping along effective policies that will ensure wetland utilization does not damage the ecosystems surrounding the wetlands;
- Include wetland management in extension training in MACO;
- Scoop dams, weirs for irrigation to limit over-exploitation of wetlands;
- Re-vegetate and protect river sources and springs;
- Regularly monitor utilization of wetlands.

Paper 4 Development in the wetlands: experiences of Concern Worldwide Zambia

Albert Mate, Programmes Component Manager, Concern Worldwide

1. Background

The Government of the Republic of Zambia through the Ministry of Tourism, Environment and Natural Resources elaborated a National Policy on wetlands conservation in 2001. The policy aims at holistic management of wetland resources for a range of benefits such as dry season agriculture, livestock grazing and harvesting of fibre, reeds and fuel wood. The policy also seeks to maintain their cultural value, their role in local transportation and their ecological functions including ground water recharge and discharge, flood control, water quality control and food chain support in the sense of biodiversity maintenance.

However, the policy is not or is little known to the stakeholders. It has not been disseminated to the key stakeholders who are the primary beneficiaries of wetland resources. This is causing conflict between those who want to conserve and those who want to exploit the wetland resources for their livelihoods.

2. Concern Worldwide work in Zambia

Concern Worldwide has been present in Zambia since October 2002, entering the country to respond to problems of drought and acute food shortage. Within our current strategic plan, Concern is currently working in three districts of Western Province. Until late 2006, Concern Zambia carried out pilot activities in Mongu district under its two organisational programmes (Livelihoods and HIV and AIDS) and has now expanded long-term development to Mongu, Kaoma and Senanga districts.

The current target area of Concern is Western Province which is the poorest in Zambia, distinguished by chronic food insecurity and one of the fastest growing rates of HIV infection in the country. A significant proportion of Western Province is covered by the Zambezi floodplain. When taken together the floodplain and the upland dambos are very important to the livelihoods systems which have evolved over time. It is important for any development interventions focused on supporting local livelihoods and reducing poverty to take into account environmental factors in order to mitigate any risk of damage through the development process.

The goal of the Concern livelihoods programme is to contribute to the improvement of livelihood security of the poor (vulnerable but viable and destitute) households among rural communities in Zambia. Concern Worldwide Zambia targets the extreme poor which include those who live in the wetlands, who are supported in time of disasters mainly caused by floods with food or cash transfer during disaster. Through DDMCs working with Satellite Disaster management Committees, vulnerable but viable farmers receive diversified seed packs comprising vegetables, maize and pumpkins, including sprayers and insecticides through partner District Farmers Associations (DFAs) working with community based Area Farmers Associations particularly linking wetland production to canal clearing activities. The approach followed is capacity building through institutional and organisational

development including training. Until now, Concern has targeted more than 6,000 vulnerable households in Mongu, Senanga, and Kaoma districts in its interventions in the wetlands and dambos through food or cash transfers, seed packs and canal clearing.

3. Wetlands of Western Province

Western Province is distinguished from other parts of Zambia by an extensive and deep covering of Kalahari sands which extend westwards into Angola and southwards into Botswana. In the marginal areas to the east in Kaoma District and the north-eastern parts of Sesheke District the sands thin out and contain higher proportions of clay derived from the underlying Karoo beds in the subsoil. The sands are highly permeable except in the transitional sands of the east, and are extremely deficient in nutrients. Rainwater is absorbed in the sands and slowly released through seepage into drainage lines, pans and along the Barotse Flood Plain edge.

Relief is very gentle and is interrupted only by the shallow north-south valley of the Zambezi River. East of the Zambezi and within the sandy uplands are widely separated river plains and circular pans thought to be of aeolian origin. To the east in Kaoma District the drainage pattern is denser and dambos are more akin to those of the Zambian Plateau.

The main wetland types exhibit a wide range of hydro-ecological sites each differing spatially and temporally in terms of soil fertility, soil moisture and depth, and duration of flooding. These variations provide considerable diversity in terms of opportunities for livelihood strategies of the inhabitants.

4. Types of Wetland

The wetlands of Western Province can be broadly divided into three main categories:

a) Barotse Flood Plain

Within Western Province the alluvial flood plain of the Zambezi River is approximately 175 kms long and varies in width from about 16 kms in the south to about 48 kms between Kalabo and Limulunga. The flood plain is seasonally flooded to depths up to 4.5 meters. The annual level and timing of flood exhibits considerable year-to-year variations.

The Plain is characterized by extensive areas of infertile sands with scattered raised mounds, ridges and shallow drainage lines on heavier soils. Both these micro-relief features provide very limited areas of more fertile soils and provide the key sites for cultivation within the Flood Plain. The two key factors affecting utilization of wetlands within the Flood Plain are (i) the timing and extent of the annual flooding of the Zambezi River, and (ii) the timing and the onset of the rains and their consistency.

b) Barotse Flood Plain Edge

The eastern edge is marked by a well defined scarp some 50 meters high rising above the plain. Its western edge is not so well defined. South from Kalabo to the

southern limit of the plain it is marked by a low lying ridge covered by the Kalamba Forest separating the flood plain from the wide Simunyange plain. Only on the western edge of this plain are the upland sands reached.

The key characteristic of this region is the belt of seepage soils formed from water seeping from the Kalahari sands and the accumulation of organic matter. This trough also receives flood water from the Zambezi as well as rain water.

In some parts, a system of tertiary and secondary drainage canals has been constructed in the past. These were connected to a main drain ('Musiyamo') running north to south along the outer edge of the 'Mataba'. Over the past four decades or more, many of these have become clogged with vegetation through lack of maintenance. Although it should be noted that Peters (1960) writing of the early 1950's notes that large areas of these seepage soils had been abandoned because of the lack of maintenance of the canals.

Utilization of this region is also conditioned by the timing and extent of the Zambezi flood and the onset and consistency of the rains.

c) River Valley Plains and Pans

East of the Zambezi Flood Plain, and generally extending just beyond the Lui River are many scattered shallow circular pans varying from less than 1 km to 5 kms in circumference. A number of these are connected by natural spillway channels and in the past many were connected by an extensive system of artificial channels known as canals. Both natural and artificial channels have over the past four decades become clogged with vegetation.

In addition to the pans there are a number of river valleys belonging to the Lui, Luampa-Luena and Ndanda Rivers and their tributaries in the east and to the North and South Lueti Rivers in the west.

Both pans and river valleys exhibit to a lesser degree the seepage sequences of the Flood Plain 'Mataba' with micro relief influencing the spatial distribution of the wetland types. These river plains are subject to 'flash' flooding from rainfall runoff. The lower reaches of the Lui, Ndanda and Luena are also subject to back-up flooding from the Zambezi River. In the Ndanda River Plain, a 30 km drainage canal was constructed in 1969. Lately this canal has become clogged with vegetation and no longer functions.

In the east in Kaoma District the Kalahari sands are much thinner and the underlying Karoo beds influence soil formation giving rise to more compact and more fertile soils. The drainage pattern tends to be denser and many narrow valley plains occur. Some narrow valley plains have no surface water even after heavy rainfall but have sites along their edges where springs occur. The larger river plains of the upper Lui and Luampa Rivers are similar to those to the west in terms of their seepage zones and flooding. In two areas perched water-tables were observed located on the tops of interfluves and were of local importance for double and relay cropping.

This area is also characterized by scattered zones of perched water tables that appear un-related to the surface relief. These are being used for winter cropping utilizing the sub-surface soil moisture.

Because the upland soils tend to be of higher fertility than the deep sands to the west, cropping of the upland soils has in the past taken precedence over the wetland sites. With increasing population pressure and shorter fallow periods on the upland soils the wetland sites are increasingly being utilized for winter cropping.

5. Changes, Potentials and Threats

Spatial and temporal dynamics of change have impacted on the utilization of wetlands over the past three to four decades. These include:

- A decline in the maintenance of canals and an abandonment of the peaty Sishanjo soils;
- The introduction of rice as a key cash crop;
- Annual and seasonal variability of rainfall and the timing and height of the Zambezi River flooding;
- Population movements within, out of, and into Western Province.
- Increases in vegetable production;
- Changes in the relative importance of maize and cassava cultivation.

These changes must be seen against a background of radical changes in government policy with the liberalization of agricultural input supply and crop marketing and the expansion of the role of the private sector. The past decade has also seen substantial losses of cattle to Contagious Bovine Pleuro Pneumonia (CBPP) with negative impacts on the availability of manure, draught power and dung as domestic fuel. The latter has resulted in a significant increase in charcoal consumption by inhabitants of the Barotse Flood Plain. Another consequence has been the rapid increase in the number of pigs with problems of garden damage due to uncontrolled foraging. Increases in population have led to shortage of key wetland hydro-ecological sites and problems of accessibility. The commercialization of reed and prugmatism cultivation has also increased competition for wetland resources.

6. Key Learning of Concern Worldwide on Wetland Development

A number of major wetland development issues have been identified from the practical interventions, stakeholder discussions, research conducted by Wetland Action for Concern and Oxfam and field visits undertaken by Concern and partners which include the following:

- **Access rights to wetland products and services particularly land:** Access to land for agriculture at the household level especially in the wetlands has been reported to be a problem. However, a Concern/MDFA survey reported 88 percent had access to both upland and wetland. Shortage of specific types of hydro-ecological sites may prevent access of these sites to late-comers to an area, mostly non-Lozi. There is artificial evidence of unused land because owners are absent for a long-time and the reluctance of Headmen to re-

allocate, or because owners were engaged in non-agricultural activities that year (e.g. fishing). The reasons for this included lack of draught power and also poor canal maintenance and water-logging. Divorced women returning to their home village may find that relatives who have been using land allocated to them are reluctant to hand back.

- **Access rights to wetland products and services – Fish Resources:** A large number of people from outside Western Province are engaged in fishing on a commercial (as distinct from subsistence) basis. Many use un-sustainable methods leading to a permanent reduction of fish stocks. Many are not registered with the BRE local authorities. Unscrupulous individuals have been setting themselves up as 'Indunas' and allocating fishing rights for payment.
- **Issues related to restoration of the Canal Systems and expansion of cultivation of Peaty Sishanjo Soils:** Canals have one or more functions: evacuation of floodwater, control of the water-table and supplying surplus water to downstream users. The scale of the canal system being restored can be relatively small and simple to large and complex. The scale of the system has important technical, organizational and institutional implications. Restoration of canal systems should not be undertaken in isolation but seen as part of the total land use system and watershed hydrology. Upstream and downstream communities must be involved. Canal restoration should be part of a broader exercise in participatory community land planning. Not only 'Sishanjo' soils are involved but also other poorly drained hydro-ecological sites (moist Matongo and Sitapa sites). Drenching of agricultural canals is seen as the responsibility of communities, while maintaining the transport canal is a government job through the Maritime Department under the Ministry of Transport and Communication, requiring sufficient coordination both at district and community level. Concern has been building capacity of the DDMCs and SDMCs to improve coordination.
- **Wetland Differentiation:** Whilst exhibiting a wide range of livelihood opportunities, two issues have emerged with respect to this diversity. The first is the timing and height of the Zambezi flood and the timing of the onset of the rains and their variability, which impact on the successful utilization of the flood retreat and rainfed crop gardens, as well the lower lying seepage sites. There is no pattern to the timing and height of the annual flood or to the timing and amount of annual rainfall, which makes their use for cropping highly precarious. The cropping window is extremely compressed and early flooding, late rains, late retreat of the flood water all can severely reduce crop yields. A second issue is the shortage of household labour to take advantage of the possibilities on offer because of the compressed cropping calendar. Women-headed households, which comprise between 30 and 50 percent of households, are particularly disadvantaged. Cattle herding (through the 'Mafisa' system) and fishing are the two main coping strategies that households have adopted. The substantial loss of cattle (through CBPP),

decline in fish stocks and outbreak of the fish disease have seriously impacted on these coping strategies.

7. Potential Risks and Solutions

A number of environmental risks related to wetland utilization and some mitigation measures have been identified by Concern working through its partners and these include the following:

- **Reduction in vegetative cover of the Uplands has negative impacts on wetland hydrology:** Experience from Kaoma District and Ndanda in Mongu district has indicated that substantial clearing of upland vegetation for agriculture has resulted in increased wet season flooding and a reduction in dry season flows and a lowering of water-tables. This indicates the need for careful monitoring of land clearing and wetland hydrology and for watershed management planning being incorporated into wetland development.
- **Expansion of irrigation into wetlands:** Whilst offering considerable potential to increase crop production and reduce livelihood vulnerability there are a number of potential environmental and social risks. Water extraction and delivery systems should be appropriate to specific sites and water supply (e.g. treadle pumps should not be used where the use of watering cans would be sufficient). Development of wetlands for irrigation precludes their use for other purposes (e.g. grazing, watering, reed and grass harvesting). As with canal restoration there is a need to plan irrigation within the context of the Community's natural resource base as a whole. Irrigation development requires consideration of backward (input supply) and forward (marketing) linkages.
- **Increasing competition for wetland resources:** With increasing use of wetland products and services, competition among users has developed. This is already occurring between grass harvesters who want burning to take place late and livestock grazers who wish to burn early. Participatory Community Land Use Planning is a process to enable communities to agree on resource use priorities and allocation.
- **Potential Loss of Local stable crop varieties:** The deliberate promotion of hybrid seed for increased yield which has substantially increased demand for improved crop varieties is a big challenge for the wetland agriculture. There is a need to be aware of the characteristics of exotic varieties compared to the indigenous ones as the local communities have abandoned the stable indigenous varieties in preference to the exotic ones. Improved sweet potato varieties yield better but only store one month compared with local variety's three months. Some of the crops grown in the wetlands have marginal suitability.

8. Ways Forward

A key issue is the need for clarity of respective roles and responsibilities of the key stakeholders, Central Government and the BRE particularly with respect to canal maintenance and uncontrolled fishing.

There is a need to support institutional and organizational coordination among key stakeholders, Central Government, BRE, District Development Coordinating Committees, Area Development Coordinating Committees, District and Satellite Disaster Management Committees and INGO's and local NGO's.

Empowerment of the local communities in decision making and participation to plan and implement projects with respect to canal restoration, small-scale irrigation, improved seed multiplication and distribution, community land use planning and watershed management planning.

Paper 5 Picking the mantle - *dambo* farming development in Luapula Province with PLARD support

Alfred Mkonda¹, Gun Mickels-Kokwe¹ and Ernest Shingalili²

1. Introduction

One of the objectives of the Agriculture component of the Programme for Luapula Agriculture and Rural Development (PLARD) is to develop sustainable integrated production systems in the dambos. Most of the dambos in the province are used to grow vegetables especially during the dry season. In most cases no good agriculture practices are observed by farmers utilizing the dambo. PLARD partners are piloting the development of sustainable integrated production systems in six dambos in the province. The results from the pilot areas will be used as a scaling up platform to other dambos in the province. This paper discusses the brief history of PLARD involvement with dambos, rationale, location of activities, beneficiaries and the status of implementation.

2. Programme Background

The Programme for Luapula Agriculture and Rural Development (PLARD) is a new phase in the 25-year history of Finnish-Zambian collaboration in the agricultural sector in Luapula province.

This programme was established in order to contribute to solving some of the problems affecting agriculture and the rural sector in the province. The problems affecting agricultural and rural development in Luapula can be divided into three major groups as: low agricultural productivity; poorly functioning markets; and inappropriate utilisation of natural resources.

The overall objective of PLARD is derived from the National Agricultural Policy (NAP) and is in line with the Fifth National Development Plan (FNDP) and is to “contribute

to the development of an efficient, competitive and sustainable agricultural and rural sector, which ensures increased income and food security for the people of Luapula province.” The Programme is structured under four components each one of them addressing the specific problems affecting agriculture and rural development in the province.

The four components and the sub-components are as follows: **(i) Fisheries development component:** with fisheries collaborative management, fish value chains development and enhancing aquaculture production and productivity as sub-components; **(ii) Agriculture development component:** with improvement of land management in targeted farming systems, improvement of productivity and quality of targeted commodities, and development of sustainable, integrated production systems in the dambo areas as sub-components; **(iii) Agribusiness development component:** with Improvements in market access, trade and communication, as well as development of agribusiness enterprises in targeted commodities as sub-components; **(iv) Institutional support component:** which contributes to the enhancement of a supportive policy, regulatory and institutional environment. It combines efforts at different levels and sectors: fisheries policy and legislation, cross-border trade, fisheries and agriculture sector statistics and data availability and quality, and institutional capacity of MACO and other key partners.

The Programme has some direct interventions aimed at addressing the cross-cutting issues of gender, HIV/AIDS and the environment; however, the main emphasis has been on mainstreaming the cross-cutting issues in all programme components and elements.

Therefore, dambo development is part of the overall agriculture development component within the programme. It particularly addresses the problem of unsustainable use of dambos as a natural resource. It is a project with an implementation budget of 120,000 Euros (approximately K600, 000,000) spread over three years from 2007 to 2010.

3. Rationale for PLARD involvement in the dambos.

Luapula province occupies an area of 50,057km² of which 20 million hectares is composed of lakes and wetlands constituting 43% of the total land area. Upland dambos constitute nearly one third of the land area of Mansa, Samfya, Mwense and the lower part of Kawambwa districts (Ritchie 2008 quoting Dougnac 1999). Therefore, ignoring dambos means losing a large proportion of the agricultural potential of the province. In addition, the human population of Luapula is about 867,491 (2000 census) and is predominantly (83%) rural. The population growth rate is 3.2% and the density has doubled from 8.3 persons per Km² in 1980 to 17.6 persons per Km² in 2005/06 (Central Statistical Office 2005). The livelihoods updates (Guveya and Kokwe, 2007) indicate that the wetland cropping is increasing in all the farming systems in Luapula, especially in Mweru and Bangweulu. Near the lakes this activity is a response to the collapse of the fisheries industry and with population growth this process is likely to continue. The increase in the utilisation of the wetlands is also a response to a decline in the fertility of upland soils. Currently,

dambos are used for field crop and vegetable production, aquaculture, livestock grazing, hunting, collection of thatch grass and wild foods.

The other important consideration is that Luapula farming is historically based on extensive production systems, which use large areas of land such as Chitemene. Due to the increase in population, extensive production systems are now unsustainable (Mickels-Kokwe, 2007). Therefore, Luapula's long-term development perspective lies towards more intensive production systems which should be supported by every agriculture development initiative. Dambo interventions in previous development initiatives in Luapula province included the promoting of dambos for cattle grazing, for crop diversification in the 1980s and for enhanced household food security and soil fertility maintenance in the 1990s.

4. Implementation principles

The focus of PLARD intervention will be on sustainable commercialisation of the dambo sub-sectors in Luapula province. Some of the building blocks towards the implementation approach are: market-driven comparative advantage using livelihood systems and value chain as tools of analysis; public-private partnerships will be used as delivery pathway with MACO being the major implementer as well as other non-governmental organizations.

5. Results and global targets

The expected **overall result** is to pilot integrated wetland production systems and the global target is 6 integrated dambo production systems piloted. **The first sub-result** is to develop appropriate technologies for improved dambo productivity and the global target is 200 dambo users using improved production and integration technologies. **The second sub-result** is to develop a sustainable commercial dambo production system and the global target is 200 dambo users confirming improved income generation from dambo production activities. **The third sub-result** is to develop institutional arrangements for dambo production systems and the global target is 6 registered production and marketing community based structures facilitating business and sustainable use by its membership.

6. Implementation strategies

Implementation is carried out by both public and private sector partners. The department of Agriculture under the Ministry of Agriculture and cooperatives is the main implementing partner. The District farmer Association and the Women Development Associations have been identified as potential implementing partners. The implementation strategies are as follows:

- Review of selected wetland cultivation system in Luapula;
- Identify opportunities to sustainably increase the output and efficiency of wetland production system;
- Develop integrated wetland production system plans in collaboration with farmers;
- Pilot integrated production systems in collaboration with farmers.

7. Planned activities

The planned activities are as shown in the table below:

Planned activities
1 Selection of dambo pilot sites
2 Carry out a baseline survey on selected wetlands
3 Identification of farmers
4 Promotion of small scale appropriate irrigation systems
5 Develop a production package for wetlands
6 Train staff in dambo water and land management
7 Training farmers in wetland conservation techniques
8 Training farmers in vegetable production
9 Promotion of Integrated production systems
10 Sourcing of planting materials
11 Farmer exchange visits
12 Bio-physical mapping of sites
13 Facilitation of development of Environmental Project Brief
14 Economic modelling of dambo farming
15 Supply of inputs to farmers and facilitating market linkages
16. Assessment of current institutional arrangements for resource mgt, production and marketing
17. Development of new institutional arrangements for resource mgt, production and marketing

8. Implementation of activities

Implementation of activities was scheduled to start in April 2007 but it could not start until July 2007. This was after the recruitment of the Agriculture coordinator and the appointment of the Component Manager and the provincial implementation dambo team. The Component Manager was designated to be the Head of the Department of Agriculture who is the Principal Agriculture Officer (PAO) and the provincial implementation team consisted of four members of staff from the same department.

So far very few planned activities have been implemented. The implemented activities include the following: (i) Literature review on wetlands; (ii) Selection of dambo pilot sites; (iii) a partial baseline survey on three of the six selected dambos; (iv) Identification of farmers, groups. In addition to these activities the programme engaged a dambo expert to streamline the planned results, targets and activities after observing that implementation of the sub-component did not move at the rate which was expected. The programme also engaged an environmental impact consultant who screened all the planned intervention including the dambo sub-component on likely impacts on the environment of the proposed activities and recommended mitigation measures.

9. Highlights from implemented activities.

A dambo selection survey was carried out to select suitable and viable dambo sites to be used as pilot areas for developing sustainable integrated production systems.

The criteria used to select these dambos were: willingness / acceptability, organization and entrepreneurship farmers, accessibility, availability of activities, land ownership, hydrological considerations, infrastructural availability, soil type, market, leverage, comparative advantage and urban- rural interactions.

A total of 36 dambos across Luapula province were initially identified as potential sites for activity implementation. After which a verification exercise was conducted to select six sites as pilot sites. The selected dambo sites were Mabumba and Mutiti dambos in Mansa, Lubunda in Mwense, Twamona in Kawambwa, Mulwe in Nchelenje and Maoma in Chiengi.

A review and strategic planning workshop was held at which a dambo expert reviewed the initial results, global and annual target as well as activities. The workshop also brought together other dambo initiatives in high rainfall zones of Zambia to share their experiences and input into the strategic plan.

Farmer groups were formed in three of the selected dambos in Mutiti and Mabumba in Mansa and in Lubunda dambo in Mwense with an average of about 20 farmers selected in each dambo in April 2008.

The problems identified during the diagnostic survey which took place at the same time as farmer group formation could be categorised in six broader areas which include water management constraints (drying up of furrow in dry hot season and water logging during rain season, weed growth in drainage blocking water flow), crop management skills and protection constraints (weed infestation, crop diseases and pest infestation, wild animals grazing on crops, birds eating cereal grains before harvest) lack of inputs/capital (fertilizer, seed, pesticides, and cultivation implements), soil fertility constraints, lack of storage facilities and unreliable markets.

The environmental impact review by Ritchie 2008 observed that PLARD's involvement in wetland development imposes an obligation to ensure that the natural wetland system and existing human use patterns are well understood before proposing changes in targeted wetlands. He recommended that: (i) a biophysical baseline in each of the six project sites be established, including water flows and water quality (chemical and biological) at peak and low flows, soil type and structure and nutrient status, (ii) map all components of the system (water courses, soil types, slope, cropping patterns and history, natural vegetation types, (iii) Quantify farmer's individual holdings and non –crop uses (e.g ponds, thatching grass, medicinal plants etc), (iv) facilitate the creation of community dambo management committees and negotiate diverse land use with conserved patches between plots to maintain hydrological function and provide areas for chikanda and other plant resources to flourish, (v) if possible record local rainfall, (vi) continuously monitor and record the effects of management (e.g. fires and grazing), (vii) preparation of a project brief to be submitted to the National Environmental Council of Zambia.

10. Constraints and way forward

The sub-component has not performed as expected and smooth implementation has not taken place even by the end of the first year of implementation. Recruitment of staff took relatively longer than expected. Procurement of motor vehicles and other equipments such as computers was delayed due to logistical problems. Motor vehicles and computers have now been procured and given to the implementing team. The other problem has been the lack of skilled capacity in the province to draw team members from. Most of the team's members come from an agricultural engineering background. This is because there were no staff available in the province with the required training background. Therefore, they had problems of effectively conducting activities which have crops, soil fertility and social economic aspects. The team is being reconstituted after the arrival in the province of new staff from training. The other constraint has been the limited counterpart funding from the Government of the Republic of Zambia (GRZ) which is meant to pay subsistence allowance to MACO staff when implementing activities. Measures to utilize the limited counterpart funding efficiently have been worked out and awaits approval from the steering committee.

References

Ritchie J. Mark (2008). Environmental considerations in Agriculture Development in Luapula province. Zambia. Volume 1. Programme for Luapula Agriculture and Rural Development, (PLARD). Publication No. 7

Guveya Emmanuel and Kokwe Misael, (2007). Luapula province livelihood systems update. A situation analysis. Programme for Luapula Agriculture and Rural Development, (PLARD). Publication No. 1

Mickels-Kokwe Gun (2007). Paper presented at the Programme for Luapula Agriculture and Rural Development (PLARD) Dambo workshop held at rock front guesthouse on 10- 11th October, 2007.

Paper 6. Challenges and emerging lessons for wetlands management in Zambia

N. Nyambe

1. Introduction

Zambia's large extent of wetlands creates a need for management and conservation to avoid their degradation and reduce over-exploitation of wildlife, fish and other wetland resources. The large extent, coupled with their rich biological diversity, makes wetland important for both local economies and livelihoods of surrounding communities and the country at large (Chabwela 1986). This paper highlights some challenges and emerging lessons for wetlands management in Zambia. It largely draws from the experiences and lessons emerging in the course of implementing the WWF-Zambia Rivers and Wetlands Project (ZRWP). As part of its work, the ZRWP conducted a two weeks community consultation management planning, and community awareness process in areas surrounding Lukanga swamps in Kapiri Mposhi and Chibombo Districts. A total of 14 sites were identified during separate consultations with traditional leaders (Chiefs and headmen) and District-based government officers. The paper provides some reflections on this exercise as well as some policy issues linked to wetlands conservation in Zambia.

2. Worldwide Fund for Nature (WWF)

WWF's global mission is to fight the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature. Actions relevant to the realisation of this mission include the conservation of the world's biological diversity, ensuring that the use of renewable resources is sustainable as well as reducing pollution and wasteful consumption. WWF has been operating in Zambia since the early 1960s and has collaborated with government, local communities and other stakeholders in implementing various conservation initiatives. A country coordination programme has been in operation since 1991 giving priority to the following:

- The conservation and management of protected areas and indigenous animal and plant species;
- Integrated conservation and development programmes;improving management capacities of Zambian conservation and environmental management institutions;
- environmental education and awareness; and
- supporting policy and legislative reform for environmental conservation and management.

Sustainable management of wetlands is an integral component of the WWF - Zambia coordination office focus areas. Globally, the management of wetlands falls within the WWF's theme on freshwater conservation, realising that wetlands are very the key fresh water ecosystems.

3. Zambia rivers and wetlands project (ZRWP)

This is a 3 year project currently being implemented by WWF – Zambia Coordination Office. The project is based on an acknowledgement that Zambia’s rivers and wetlands, as in other parts of the world, are inherently unstable and constantly changing and face changes in frequency, magnitude and variability of rainfall due to climate change. But there are various unnatural causes of change in rivers and wetlands such as:

- Increased encroachment onto catchments, river banks, and floodplains for grazing;
- Subsistence and large-scale agriculture; industrial developments and settlements;
- Anthropogenically induced modification of natural flows through water abstraction and impoundments;
- Pollution and eutrophication leading to a proliferation of aquatic weeds such as *Salvinia molesta*, *Mimosa pigra* and *Eichonnia crassipes*; and
- Loss of species (e.g., fish, reptiles and amphibians) and the imperilment of several more indicate the modified nature of the rivers and wetland ecosystems.

The project has two components. One component addresses environmental flows, with the stated goal being “... to increase ecological, economic and social benefits through implementation of environmental flows by improving dam operating rules, in conjunction with other dams outside or bordering the country” (WWF 2007: 29). The second component - the sustainable management of wetlands’- goal is “ ... to restore and maintain the ecological integrity of important wetlands in Zambia, as provided for under the Ramsar Convention, and facilitate the establishment of a national wetland policy framework” (WWF 2007: 29). One of the expected outputs of the second component is the development of management plans two pilot sites: Kafue flats and Lukanga swamps, in accordance with Ramsar criteria. Both wetlands are Ramsar sites.

4. Lukanga Swamp

The Lukanga swamp area is located in central Zambia (14°24’S 027°38’E), with an estimated total catchment area 19,490km². The main swamp area measures approximately 2,500km² and 2,600km² depending on the level and intensity of floods (Chabwela 1998). The swamp is shared between Chibmobo and Kapiri mposhi districts. It is one of Zambia’s eight Ramsar sites, having been designated in 2005.

Local inhabitants are directly and indirectly dependent on the swamp for fish, fresh water, fuel, medicinal plants, pasture and wildlife. The swamp is also home to hundreds of reported bird species. It supports populations crocodile, and is considered an important site for conservation of red lechwe, oribi, marsh mongoose, sitatunga, bushbuck and python. Poaching and over-fishing are two of the major conservation problems faced in the swamp (Ibid).

Despite being rich in biological terms, the socio-economic realities of the local communities’ contrasts quite sharply, with high poverty levels being a dominant feature. Various goods and services associated with Lukanga swamp include pasture, fish, wildlife, habitats for wildlife, tourism opportunities. The local livelihoods

depended on harvesting wetland resources. The swamp also provides opportunity benefits for trading locally produced agricultural and other products, e.g. maize. Culturally, the swamp is renowned for its cultural significance as a hiding place for the Batwa people, renowned for their fishing prowess, from strangers (WWF 2008).

5. Community Consultations

A two weeks consultation exercise was undertaken to engage the locals on various issues affecting Lukanga swamp. The exercise was undertaken with two objectives:

- to serve as a wetlands conservation awareness initiative and
- to collect inventory and baseline data for management planning purposes.

Participating in the exercise were district teams comprising various natural resources line departments such as wildlife, forestry, fisheries, agriculture and others such as community development. A number of issues emerged from the consultations as outlined in the following abridged account reflecting on institutions, resource-use conflict, wildlife, fishing and culture.

a) Institutions

Perhaps because Lukanga swamp is mainly associated with fish, the dominant institution is the Department of Fisheries (DoF). Another institution which periodically operates in the area is the Zambia Wildlife Authority. The two institutions were heavily criticised heavily for being very inclined to law enforcement, especially the use of excessive force during the annual closed fishing season (December to end of February). During the consultations, the mere presence of a representative of ZAWA was repeatedly viewed with extreme suspicion. There are hardly any other institutions on the ground. The DoF has facilitated the creation of Local Fisheries Committee in the two districts. The committees are more active in Kapiri mposhi, but their activities are nonetheless at a minimal partly due to logistical and capacity problems.

b) Resource use conflicts

There are growing local resource-use tensions, especially between grazing and crop growing. Cases of livestock destroying fields of maize and other crops are common, especially in areas where crop growing is dominant. The livestock/ crop tension has also assumed ethnic dimensions as the majority of crop farmers are migrant Tonga speaking (from southern Zambia) while the crop farmers are the indigenous Lenje people who in addition to being crop farmers, practice open grazing. Some migrant fishers complained about difficulties in accessing land for agriculture. They accused the local Lenje and Batwa traditional leadership of segregating against them on grounds that they are migrants. Cases of human/wildlife conflict are limited to occasional crocodile attacks and previously hippo attacks. There are presently no hippos in the swamps and no reports of crop damage by wildlife were recorded.

c) Wildlife

Previously, the Lukanga swamp teemed with wildlife. Poaching decimated much of the wildlife, confining the remaining wildlife to islands and other isolated places. Poaching has reportedly reduced only because it is hard to find game nowadays.

Poaching was carried out by non-locals in collaboration with local individuals while some poachers came to the area in the guise fishermen. A growing concern about wildlife is the growth in cattle rearing, an activity believed to be taking away habitats, e.g. permanent stocking of livestock on islands which previously served as wildlife habitats.

d) Fishing

The fishery resource is a very important in Lukanga swamps. Majority of the fishers are migrants, mainly from the northern parts of Zambia and are accused of indiscriminate/ inappropriate fishing methods such as drag nets, bashing, and small meshed nets including mosquito nets. There are contested views on the state of the fishery, with some of the fishers openly acknowledging that the catches have substantially declined over the years. The indigenous people support this view and complain that they hardly eat any fish as fish traders buy all the fish inside the swamps (before it lands). Barter systems between fish traders and fishermen ensure that fishermen reserve all their catches for their established clients (fish traders) who take the fish to the lucrative markets on the Copperbelt Province and other urban areas.

e) Culture

The local Batwa and Lenje people bemoan the loss of the traditional values they associated with Lukanga swamps. They especially attribute this loss to the uncontrolled in-migration of fishers from other regions who do not observe the traditional values. For example, women were not allowed to enter, let alone live in the swamps. Playing of radios, consuming alcohol, whistling and wearing red clothes while in the swamp are some of the norms that are presently being violated. Fishing was also a seasonal activity. Fishermen established temporal camps and returned to the uplands for farming during the rainy season, but this practice is currently being grossly violated by the migrant fishers.

6. Challenges and Lessons

A number of challenges and lessons were learned from the consultative process. While not entirely new, these challenges and lessons nonetheless re-emphasise the need for caution and sensitivity to ground realities, especially in the envisaged management planning and as outlined below:

- The complex linkages between socio-economic conditions and conservation of wetlands as well as local politics. Their significance becomes even more central as Zambia seeks to kick-start the processes towards developing a national wetlands policy;
- Extreme levels of poverty and deprivation, absence of easily accessible basic institutions for health and education, clean and reliable supplies of water and appropriate sanitation were often highlighted and prioritised over conservation matters;
- The cultural sensitivity of the Lukanga swamp is yet another factor about which the indigenous communities spoke passionately and clearly an element that should be carefully considered in the policy development and

management planning processes as well as implementation of subsequent activities;

- Local institutions aimed at promoting conservation need to be either created or strengthened. The dominant grassroots institutions are the local fisheries committees created by the Department of Fisheries are presently too weak to provide the needed leadership for a vision of integrated wetlands;
- There was evidence in the breakdown or weakening of traditional authority. For example, at one of the sites (Kabosha in Chibombo District), the community is held at ransom by a group of youths who threaten them and are controlling fishing activities in the area;
- Political interference. Some ill-informed local politicians tried to disturb the consultation processes by appealing to some traditional leaders and local people and peddling rumours aimed;
- Migrant resource users (fishers and farmers) presented additional complexities. For example, there was a wide feeling that the migrant fishers recklessly fish the swamp because they can easily relocate in the event of a decline in fish numbers.

These realities point to the need for enhanced dialogue with the local communities, taking into account their indigenous knowledge and due cognisance of the possible livelihood implications of any proposed wetlands conservation initiatives. To effectively engage policy and management planning processes, there is also a very strong need for well-capacitated local institutions that uphold and practice good governance and democratic values at the local level. In all this, wetlands conservation awareness ought to be promoted alongside civic education.

7. Some Policy Implications

That there is no national wetlands policy in Zambia is ironical, especially given the large extent of wetlands in the country and their importance to both the local and national economies. A draft policy has been in place since the late 1990s. This raises the question of whether or not management plans can be developed in the absence of a guiding policy framework. Or should the opposite happen: develop management plans on a pilot level, implement some activities and inform the process of policy development.

Either way, the challenge remains: some of Zambia's wetlands, in the absence of sound management and conservation, have been heavily degraded, and wetland resources are being heavily exploited. Thus, whether a policy is developed in the near future or not, there is still an urgent need to maintain and or develop the productivity of the wetlands as well to improve and spread the benefits local communities derive from wetlands. Importantly, support amongst local people and decision-makers is needed for conservation. Given the various stakeholders, in the event that a national policy is developed, it has to be consensus-based and stakeholders driven if its aspirations are to be realised.

8. Concluding Remarks

This paper has highlighted some of the challenges and emerging lessons for wetlands management in Zambia. The absence of a national wetlands policy is a worrisome gap that needs urgent filling. Even in the absence, initiatives for wetlands conservation and sustainable resource utilisation ought to be promoted and implemented. Further, given the likely delays in finalising the policy, it is critical that efforts for innovative strategies, the building of necessary partnerships and establishing local institutions should be promoted. Field activities should be used to encourage deeper reflection on the challenges for wetlands management as well as the development of sound strategies.

References

Chabwela, H. N. 1986. 'The ecology and resource use of the Bangweulu Basin and Kafue Flats'. In RCV Jeffrey, Chabwela, H. N., Howard, G., and Dugan, P.J. (eds.) Managing the wetlands of Kafue Flats and Kafue Basin. Proceedings of the WWF-Zambia Wetlands Project Workshop, Musungwa Safari Lodge, 5th -7th November 1986. IUCN. Gland, Switzerland.

Chabwela, H. N. 1998. An ecological evaluation of the Lukanga swamp. ECZ, MENR, Lusaka.

WWF. 2007. Zambia Rivers and Wetlands Project: Working on environmental flows and sustainable management of major rivers and wetlands in Zambia. WWF ZCO, Lusaka.

WWF. 2008. Strengthening stakeholder dialogue, participation and networking for the development process of a wetlands management plan for Lukanga swamps: Preliminary stakeholders' workshop proceedings. Zambezi Source Lodge, Kabwe, 16-18 April 2008. WWF-ZCO, Lusaka.

3.4 Policy development relating to wetland management for agriculture and other livelihood purposes.

Paper 1 Dambo Irrigation in Zambia

George Sikuleka, Ministry of Agriculture (Irrigation Department)

1. Background

Zambia covers an area of 752 600 square kilometres and lies between 8 and 18 degrees south of the equator, and 22 and 32 degrees east longitude. It shares boundaries with eight other countries and at least six of its SADC partners.

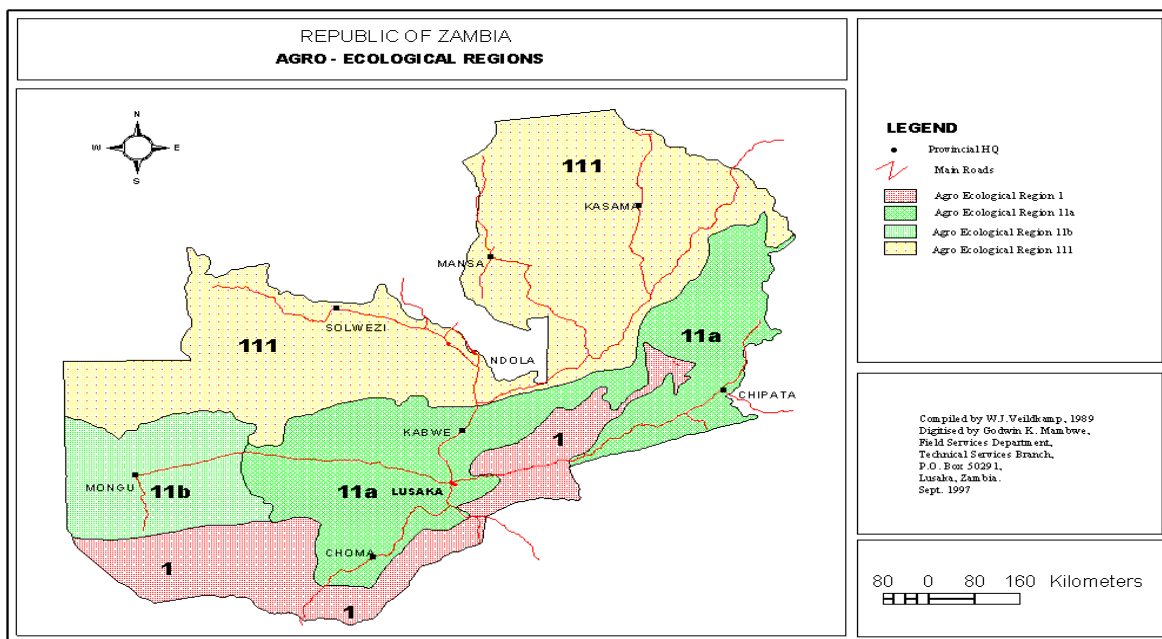
The population is estimated at above 10 million people (CSO 2000), with an average density of 13 people per square kilometre. The annual population growth average was 3.7% during the period 1980 - 1990, compared to 3.0% during 1965 - 1980, largely reflecting a drop in infant and child mortality rates. For the country as a whole, approximately 55% of the population reside in rural areas, while 44% are urban dwellers. Furthermore, it's now estimated that about 80% of the Zambian population live in abject poverty, without access to basic social services such as clean water supply, health, schools, infrastructure, etc. Even more devastating to the declining economic performance of the country, has been the HIV/AIDS pandemic along with the high incidence of other diseases and infections which have increased the poverty levels beyond the family or household and individual levels to impact on the human resource capacity.

2. Land Resources

Zambia is endowed with abundant agricultural resources. Approximately 12 percent of the landmass is suitable for arable agriculture of which currently, only 14 percent of the arable land is cultivated.

The country has a good climate and plenty of water resources. The rainfall pattern defines the country's three agro-ecological regions (map 1). Region 1 is a low rainfall region (less than 800mm annually) in the valley areas in the south of the country. Region 2 has moderate rainfall (800-1,200mm annually) on the central and eastern plateau, while Region 3 covers the northern areas with annual rainfall above 1,200mm. Each region has unique characteristics which are suited for the production of a diversity of crops, livestock, and fish enterprises.

Map 1.



3. Water Resources

Zambia has relatively abundant surface and underground water resources. Table 1 below shows the potential water resources and projected uses from 1995 to 2015.

Table 1: Zambia Water Resource Potential and Use Situation

Source	Surface (Mm ³ /a)		Groundwater (Mm ³ /a)		Total (Mm ³ /a)	
	1995	2015	1995	2015	1995	2015
	86 500		57 500		144 000	
Use	Surface (Mm ³ /a)		Ground water (Mm ³ /a)		Total (Mm ³ /a)	
	1995	2015	1995	2015	1995	2015
Domestic and Industrial	378	662	63	126	441	788
Agriculture	1 829	4 478	126	252	1955	4730
Hydro power	36 266	37 843	-	-	-	-
Flow to other countries	48 029	43 267	-	-	-	-

Source: Modified from National Water Resources Master Plan, Ministry of Energy and Water Development, 1995.

4. Land Tenure

Zambia's land tenure is categorized into two main systems: customary and leasehold. Customary land tenure accounts for 94 percent of the total land area, while the balance of 6 percent is leasehold. Customary land tenure system is controlled and allocated by traditional authorities, while leasehold tenure is controlled and allocated directly by the state and provides for title deeds for a renewable period of 99 years.

5. Poverty Reduction Strategy

Government has in recent years recognised that Zambia's socio-economic indicators have drastically deteriorated, and in order to reverse this trend it has embarked on implementing economic reforms and restructuring programmes. These measures place great emphasis on market pricing and liberalization and flexibility in resource mobility. This general approach is well defined in the government's Poverty Reduction Strategy Paper PRSP of September 2001, and the Fifth National Development Plan (FNDP, 2006-2010) estimates that Zambia's economy will require to grow by about 6 – 8 percent on an annual basis up to the year 2015, in order to achieve acceptable poverty reduction levels. Within the context of FNDP, public and private investments in key sectors of the economy such as tourism, mining, agriculture and industry related to infrastructure development along side with institutional and structural reforms such as better pay, accountability as well as improved financial management in the public sector have to be implemented.

Irrigation is seen as one of the most important interventions essential for intensification of agricultural production which will assist in meeting targets for poverty alleviation, food production and economic recovery by the year 2015. Consequently, it has been placed as FNDP agriculture sector priority programme 1. The government expects to increase the current irrigated land by at least 70,000ha by the year 2010. At the same time institutional, policy, and economic frameworks will be important factors that determine the extent to which full investment potential in the irrigation sector shall be realized practically.

6. Characteristics of Zambian Agriculture

There are three main categories of farmers in Zambia: small-scale, medium-scale and large-scale. Small-scale farmers are mostly subsistence producers of staple foods with an occasional surplus for sale on local markets. Medium-scale farmers produce surplus maize and other cash crops mainly for the local market, while large-scale farmers produce for both the domestic and international markets. Their features are summarized in table 2.

Table 2: Characteristics of Zambian Agriculture

Characteristics	Small-scale	Emergent	Medium-scale	Large-scale
Number 1999)	459,000	119,200	23,230	>40
Total Ha	0.5-9.0	10-20	20-60	>60
Crops grown	Food crops	Food/Cash crops	Food/Cash crops	Cash crops
Production Focus	Subsistence	Commercial/ Subsistence	Commercial/ subsistence	Commercial

Source: Ministry of Agriculture and Cooperatives: *Agriculture bulletin 2000*

7. Current Agricultural Policy

The vision for the agricultural sector is "to promote development of an efficient, competitive and sustainable agricultural sector, which assures food security and increased income". This vision also strives to contribute to the overall goal of the

Poverty Reduction Strategy Paper (PSRP), which is to achieve “poverty reduction and economic growth”.

The main thrusts of the National Agricultural Policy are liberalization, commercialization, promotion of public and private sector partnerships, and provision of effective services that will ensure sustainable agricultural growth.

The vision for the agricultural sector recognizes the need to strengthen and expand the emerging opportunities and to also deal with the challenges facing the agricultural sector. In line with this vision, the specific objectives of the agricultural sector are:

- To assure national and household food security;
- To ensure that the existing agricultural resource base is maintained and improved upon;
- To generate income and employment to maximum feasible levels;
- To contribute to sustainable industrial development; and
- To expand significantly the sector's contribution to the national balance of payments.

To achieve the above objectives, the strategies include:

- Strengthening and monitoring the liberalization of markets and facilitating private sector development;
- Diversification of agricultural production;
- Strengthening and facilitating the provision of agricultural services;
- Reviewing and realigning institutional and legislative arrangements;
- Development of infrastructure in potentially productive areas;
- Development and promotion of appropriate technology;
- Promotion of gender equity in resource allocation and access to agricultural services focusing more on women and young farmers;
- Promotion of sustainable and environmentally sound agricultural practices;
- Putting in place emergency preparedness measures to mitigate unstable weather and for the prevention and control of pests, crop, and livestock diseases of national importance;
- Irrigation development;
- Regulate the introduction of genetically modified organisms, and maintenance of bio-diversity.

Under the agricultural vision and proposed policies, both food crops and cash crops will be targeted for increased production and productivity in order to attain and sustain food security and income generation, taking into account agro-ecological conditions. The Government’s vision is to ensure that an increased number of small-scale farmers move from being subsistence to being fully integrated in commercial production through out-grower and other suitable arrangements. In this regard, the Kaleya outgrower scheme and the Zambia Sugar Expansion project are seen as models for possible adoption in future irrigation development.

8. Government Irrigation Sector Policy

The overall thrust of the Irrigation Policy can be summarised as follows:¹

- To remove constraints on existing irrigators, thereby encouraging new private investment in increased area and towards greater productivity;
- Encouraging the emergence and gradual commercialisation of new irrigators from among the traditional farmers.

Overall Objective: A well-regulated and profitable irrigation sector that is attractive to both private investors and Zambia’s development partners.

Irrigation Potential: The irrigation potential is estimated at 423,000 ha of which 100,000 ha (24%) is currently irrigated by commercial farmers and large estates (52,000ha) - cultivating sugar, wheat, coffee, tea and other plantation crops, and by small-scale and emergent farmers (48,000ha).² Table 3 below shows a summary for irrigation potential in Zambia.

Table 2: Summary of Irrigation Potential in Zambia

Catchment/basin area	Existing scheme	Additional irrigation potential	Total potential (ha)	% of total potential
Upper Zambezi Basin	2,000	110,000	112,000	26
Kafue Basin	13,000	152,000	165,000	39
Luangwa Basin	-	14,000	14,000	-
Luapula and Tanganyika basin	2,000	62,000	64,000	15
Commercial farms in different basins	8,000	-	8,000	-
Ground water irrigation	N/a	60,000	60,000	14
Total	25,000	398,000	423,000	100

Source: World Bank, PRSP, Ministry of Finance and National Planning.

Irrigation Development: Irrigation development in Zambia is diverse in terms of water sources, technology, and, institutional arrangements. There are three types of farmers, namely: subsistence, emerging and fully commercial farmers. Irrigated areas tend to lie:

- Along the line of rail;
- Above Zambia’s karstic areas where groundwater is abundant at practical depths; and,
- Adjacent to standing water bodies or rivers regulated by dams (large remote dams or small scheme specific structures).
- In dambos (wetlands), especially subsistence and emerging farmers.

¹ GRZ/FAO: (2004) Irrigation Policy and Strategy

² GRZ/FAO: (2004) Irrigation Policy and Strategy

There are various technologies used such as:

- Simple unregulated gravity fed surface schemes (some of which have been in operation since before independence and continue to function well under farmer management);
- Hand carried buckets;
- Low-tech, but very effective drip systems that are pressurised by means of header tanks which themselves are filled by treadle pumps;
- High-tech drip systems that are mechanically pressurised;
- Under and over canopy sprinklers;
- Rain guns;
- Centre pivots.

While sector operations are the responsibility of official government institutions (Irrigation Section of MACO) at National, Provincial and District Level, there are other important irrigator institutions, which include:

- Large agribusiness estates;
- Individual commercial farms;
- Contract grower groups;
- Out grower groups;
- Associations of smallholders

Progress in Adoption of Simple Irrigation Technologies: The promotion of appropriate low cost irrigation technologies for smallholder farmers was initiated in February 1996 when FAO Special Programme for Food Security (SPFS) recognized the impact of such technologies on household food security and income for small scale farmers in Zambia. In collaboration with the Technical Services Branch, Ministry of Agriculture and Cooperatives (TSB/MACO), a major training programme was launched to familiarize extension staff and farmers with irrigated horticulture during the dry season. This effort was later (1998) further boosted through the IFAD-funded Smallholder Irrigation and Water Use Programme (SIWUP).

The technology which has been promoted with significant results is the (Chova) treadle pump (TP). Three models promoted are the River, Deki (tubewell) and pressurised pumps. Initially some models (River and Deki) were imported from Bangladesh and pressure TP from Masvingo, Zimbabwe. Modifications were made to suit a number of situations. Currently, the Money Maker treadle pump imported from Kenya, which is reported to be more gender friendly, is also gaining ground.

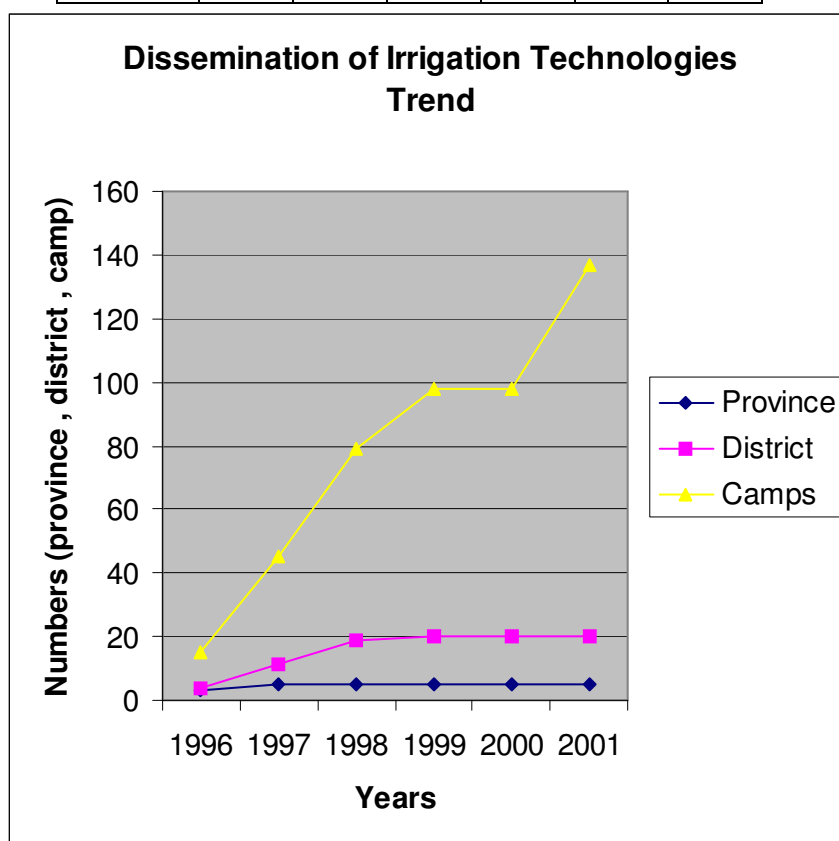
The most popular pump is the pressure model which can pump from a hand dug well at 6 meter suction lift and produce a discharge pressure of up to 10m. It can irrigate comfortably 0.25ha (1lima). It costs about US\$100 but requires an additional similar investment in 100m of pipe (or low cost drip equipment) to fully utilize its potential. The treadle pump results in tremendous labour saving compared with bucket irrigation (2 hours of irrigation for 1 lima instead of 8 hours).

The project contracted International Development Enterprise (IDE), a Zambia based international NGO for its promotion. Treadle pumps were demonstrated in a total of 137 camps in 20 districts during the life of the project. The project also provided funding, through IDE, for local manufacturers to locally produce the treadle pumps.

By 2002 more than 2400 treadle pumps had been sold through IDE and an unknown additional number being sold by about 30 manufacturers. It is estimated that by 2002 about 600ha of land was irrigated agriculture through this technology mainly by smallholder farmers in dambos.

Table 3: SIWUP Pilot Sites for Dissemination of Irrigation Technologies

Year	1996	1997	1998	1999	2000	2001
Province	3	5	5	5	5	5
District	4	11	19	20	20	20
Camps	15	45	79	98	98	137



Other technologies promoted for smallholder and medium scale farmers in the country are the micro drip irrigation systems and low pressure sprinkler systems. The micro drip systems namely: Integrated Irrigation Systems (IIS) Drip kit (developed in Zimbabwe), Indian Drip kits (developed in India) and Netafim Family kit (developed in Israel). A number of smallholder farmers are very excited about these systems because of significant savings on water and labour, and the possibility of expanding their irrigated land.

9. Dambo Irrigation

Dambos are seasonal wetlands, which expand and contract, and are usually located in valley bottoms where they are perched behind an impermeable, often subterranean barrier. Typically their soils comprise fertile vertisols or other fine textured soils with high moisture holding capacity. As such they represent an excellent location for irrigated agriculture, particularly the production of short season, high value crops.³

A study carried out in Eastern Province brought out some interesting results concerning dambo utilisation at four sites.⁴

Programme Indicators- Baseline

Indicators	Makungwa	Mcheleka	Vuu	Mwase
Dimba ownership 0(0%)	51.9	94.0	29.7	65.6
Location of gardens (%)				
Upland	4.5	0		
Dambo	31.8	45.5	50	48.6
Stream/river	9.1	54.5	20	27
Near dam	54.5	0	30	24.4

From the table above, up to 50% of smallholder gardens are located in dambos/wetlands. It is apparent therefore that dambos/wetlands play a significant role in gardening.

Among the major crops grown, rape, tomato, cabbage, maize, beans, banana and maize are the major crops grown as shown in the table and chart below.

Programme Indicators- Baseline

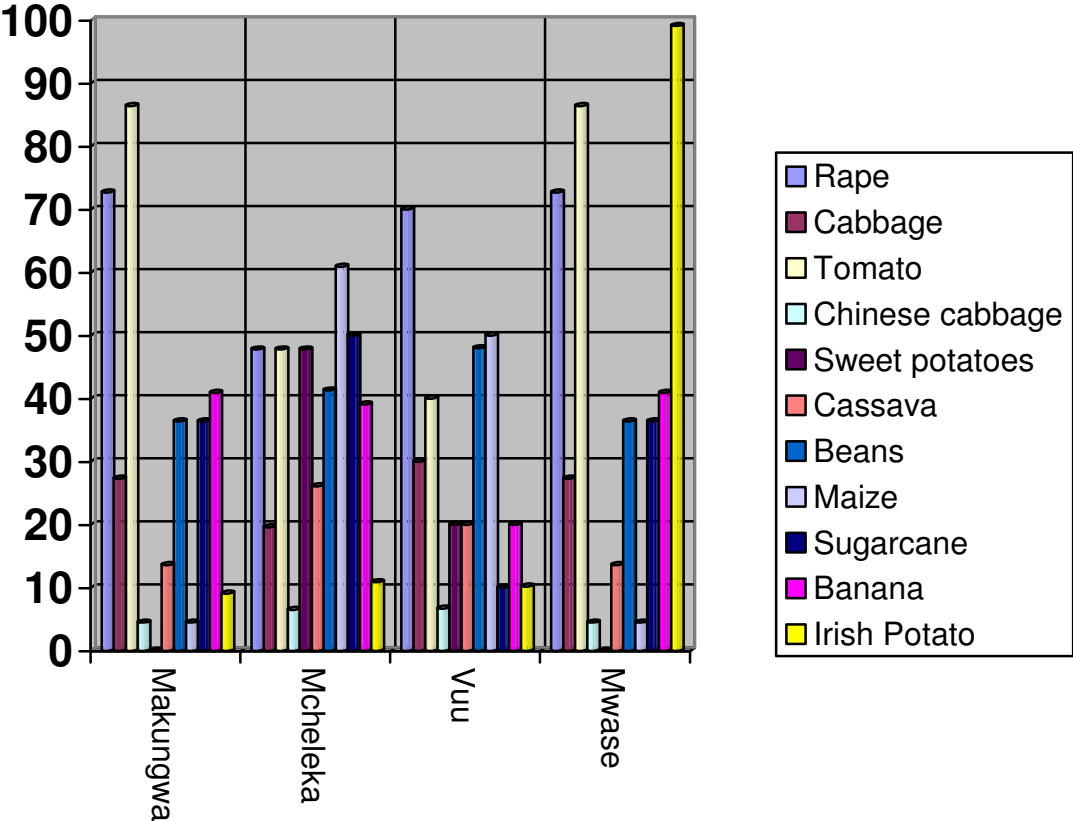
Dimba crops (% of cases)	Makungwa	Mcheleka	Vuu	Mwase
Crop	Makungwa	Mcheleka	Vuu	Mwase
Rape	72.7	47.8	70	72.7
Cabbage	27.3	19.6	30	27.3
Tomato	86.4	47.8	40	86.4
Chinese cabbage	4.5	6.5	6.7	4.5
Sweet potatoes	0	47.8	20	0
Cassava	13.6	26.1	20	13.6
Beans	36.4	41.3	48	36.4
Maize	4.5	60.9	50	4.5
Sugarcane	36.4	50	10	36.4
Banana	40.9	39.1	20	40.9
Irish Potato	9.1	10.9	10.2	99.1

Whilst most of these crops are critical for food and nutrition, sugarcane is more of a cash crop.

³ GRZ/FAO: (2004) Irrigation Policy and Strategy

⁴ Mwanka Rural Development and Environmental Foundation (2002): Community Baseline /Needs Report

Dimba crops



The pictures below show:

- A drip irrigation demonstration with an excellent crop of cabbage; and
- Furrow irrigation system at Katuba Smallholder Irrigation scheme.





Katuba Smallholder Irrigation Scheme, Chibombo District, Central Province

10. Constraints

Despite the encouraging diversity of Zambia's irrigation sector, its successful operation and expansion remains limited by a wide variety of constraints, which fall into four categories, namely: Finance and Investment; Institutional and Social; Policy and Legal;; and Markets.

- Weak service delivery in irrigated agriculture;
- A poorly enforced legal framework that neither regulates nor allocates water in an equitable or economically advantageous fashion;
- Weak badly focussed regulatory mechanisms;
- Lack of appropriate and/or inaccessible credit facilities and mechanism;
- Inadequate access and communications infrastructure;
- Inadequate marketing institutions, infrastructure and services;
- High operating costs leading to reduced profitability for irrigated farming;
- Lack of skills for sustainable management of dam resources.

11. Ways Forward

The challenge while realising the intrinsic and environmental nature of dambos is to maximise the sustainable productivity of all of them.

There is an opportunity for a study that enhances current understanding of what comprises sustainable dambo utilisation and the transformation of that understanding into easily disseminated guidelines.

There is urgent need to initiate the dambo assessment to identify suitable locations, assess impacts of project use and indicate small-scale water control and access interventions including dry season control of dambo drainage. An end product of the assessment would be the production of sustainable use guidelines.

References

GRZ/FAO (2004). Irrigation Policy and Strategy

MEWD/JICA (1995) National Water Resources Master Plan.

MFNP (2006) Fifth National Development Plan

Ministry of Agriculture and Cooperatives: *Agriculture bulletin 2000*

Mwanka Rural Development and Environmental Foundation (2002): Community Baseline /Needs Report

Paper 2. Dry season cropping interventions in the Barotse plains and other parts of Zambia: policy lessons harvested

Sina Luchen, FAO, United Nation's Food & Agricultural Organization

1. Introduction

Zambia is endowed with a variety of wetlands. Their geo-morphological and socio-economic characteristics and utilization among local communities has extensively been documented (Owen et al.1995; Kokwe, 1993 ed; Sutcliffe 2007). Wetlands enable low input crop production and food access to local communities in normal years and following main season crop failure due to climatic hazards such as drought or floods. The strengthening of crop production in the wetlands is a sustainable way of fostering food access to remote communities that may not easily be accessed by protracted food relief operations during times of agricultural related disasters.

In 2006 and 2007, FAO with financial assistance from the Government of South Africa (S.A) and European Commission (E.C) supported dry season cropping interventions in some wetlands as part of disaster recovery efforts following the 2004/05 season partial drought and the floods of February 2006 respectively. The interventions primarily focused on input provision to flood affected households (HHs) of the Barotse flood plains and wetlands in Southern and Eastern province. A total of 200,000 Euros was provided by the E.C to support dry season cropping in North Western and Western province in 2007.

2. Project Interventions

2.1 S.A funded "Dry Season Cropping Support in Eastern, Southern and Western provinces - 2006/07"

2.1.2 Objective

The Dry season cropping support was part of the overall project "Enhancing Food and Nutrition Security and Improving Livelihoods among Vulnerable Households in Drought Prone areas" It had an 18 months duration from April 2006 to October 2007 and was meant to contribute to Government efforts to mitigate the negative effects of the chronic droughts in the Eastern, Southern and Western Provinces.

The specific objective of intervention was to enhance food security among drought affected farmers with technical support and inputs by harnessing wetlands for crop production, thereby filling the food gap that often affects vulnerable HH towards the end of the year and before the next harvest in the following year. The intervention benefited 5000 HHs with secondary impact on 30,000 people in Mongu, Lukulu and Senanga, Mambwe, Lundazi, Chipata, Choma, Siavonga, Sinazongwe and Kazungula.

2.2 E.C funded "Emergency Provision of Agricultural inputs in Western and North Western Province- 2007"

2.2.1 Objective

The overall objective of the intervention was to urgently provide agricultural inputs for dry season cropping along the Barotse and Zambezi plains in order to restore the agricultural production base and bridge the food gap for the communities whose crops were destroyed by floods that occurred in February 2007 in Western and North Western Provinces. The intervention benefited 6150 HHs and a possible secondary impact on 36,900 people in Chavuma, Mwinilunga, Zambezi, Kalabo, Lukulu, Mongu and Senanga.

3. Institutional Implementation Arrangements

3.1 S.A funded “Dry Season Cropping Support in Eastern, Southern and Western provinces - 2006/07”

Under the S.A supported project in 2006, the FAO signed letters of Agreement (LoA) with the Ministry of Agriculture and Cooperatives (MACO) through the Provincial Agricultural Coordinators (PACOs) in Eastern and Southern provinces, as well as with two Non Governmental Organisations (NGOs), Africare in Southern province and World Conservation Union (WCS) in Eastern province. The role of the MACO was to provide coordination and monitoring of the activities being implemented, while the two NGOs were the implementing partners (IPs). The NGOs carried out beneficiary identification, training/sensitization, registration and input distribution in collaboration with MACO.

After the first year of implementation project management recognised the need for the MACO to start taking ownership of dry season cropping activities in order to foster sustainability of the intervention. During 2007, therefore, the MACO became the IP for the dry season cropping activities in Southern Province and Sesheke district. FAO signed LoAs with the PACOs of the Southern and Western provinces to provide coordination and monitoring for the activities being implemented. It also signed LoAs with District Agricultural Coordinators (DACOs) in Choma, Kazungula, Mazabuka, Siavonga, Sinazongwe and Sesheke to enable them to execute project activities. Activities included beneficiary identification, selection, sensitization, input distribution and the provision of relevant extension messages.

3.2 E.C. Supported “Emergency Provision of Agricultural inputs in Western and North Western Province- 2007”

FAO partnered with the Ministry of Agriculture and Cooperatives (MACO) through the Provincial Agricultural Coordinators (PACOs) and District Agricultural Coordinators (DACOs), as well as a number of NGOs to implement the project in various districts as follows; Chavuma and Zambezi: P.M. Development Agency/MACO, Mwinilunga: World Vision Zambia/ MACO, Kalabo: World Vision Zambia/ MACO, Lukulu: MACO, Mongu: Catholic Relief Services, Diocese of Mongu/MACO, Senanga: Concern Worldwide/MACO.

The role of the MACO through the DACOs was to provide coordination, monitoring and provide appropriate extension messages for the activities under implementation. The NGOs were responsible for activity implementation, including

identifying the beneficiaries in liaison with the DACOs and the District Disaster Management Committees (DDMCs).

4. Activities and Outputs

4.1 S.A funded “Dry Season Cropping Support in Eastern, Southern and Western provinces - 2006/07”

In 2006, three districts truncated by the Barotse flood plains in Western province (Mongu, Lukulu and Senanga) together with three other districts in Eastern province (Mambwe, Lundazi, Chipata) and four districts in Southern province (Choma, Siavonga, Sinazongwe and Kazungula) received dry season cropping input support based on the Vulnerability Assessment Committee (VAC) 2006 in-depth assessment recommendations. The intervention supported beneficiary households (HHs) with inputs that included some treadle pumps, hybrid maize seed (5 Kg), beans, various vegetables, basal dressing (NPK 10:20:10) and top dressing (46% Nitrogen) fertilizer enough to cultivate at least 1 Lima (0.25 Ha) of crops. A total of 1810 households benefited from the support.

Following a mid term review of the project, in 2007 dry Season cropping support activities were confined to Choma, Siavonga, Sinazongwe, Mazabuka, Kazungula and Sesheke for operational reasons. A total of 3190 HHs received seed and fertiliser input support. To ensure sustainability, assistance focused on the provision of early to medium maturing open pollinated varieties (OPVs) of maize (2.5 Kg) and vegetables (Amaranthus, Rape, Okra and Tomato) cultivate at least 0.5 Limas (0.125 Ha) per HHs. The ZM 421, ZM 521 have a relatively low nitrogen requirement, thus reducing production costs to farmers. HHs in Siavonga, Sinazongwe and Sesheke received ZM 421, in Mazabuka and Sesheke ZM 521, while in Choma it was high protein maize Obatampa. In Lutembwe an early maturing Cowpea was also provided to Siavonga and Sinazongwe.

The activities carried out by the project included site selection, beneficiary identification, sensitization, selection, registration undertaken by Africare, input procurement and transportation undertaken by the FAO. Africare distributed the inputs. MACO provided coordination and monitoring for the activities.

Outputs

- During 2006 and 2007, 17.0 MT of seed of maize, 0.5 MT beans, 0.5 MT cowpeas, okra, rape, tomato and cabbage seed were procured and distributed to vulnerable HHs starting in the month of July.
- 43 MT of D compound and 43 MT of Urea fertilizer were procured and distributed to vulnerable beneficiary HHs.
- 80 pressure treadle pumps were procured and distributed to groups of targeted vulnerable farmers in Siavonga and Kazungula.

- Dry season cropping guides were produced and distributed to all the IPs in order to build capacity.

4.2 E.C funded “Emergency Provision of Agricultural inputs in Western and North Western Province 2007”

FAO provided technical support and facilitated provision of inputs to 3 targeted districts along the Zambezi flood plain in North Western province and 3 others along the Barotse plain in Western province. Input distribution commenced in July which was rather late. In Zambezi, 70% of the beneficiary farmers had their crop reaching physiological maturity by early December. The main activities were beneficiary identification, selection, sensitization/training in wetland cropping undertaken by the NGOs. Inputs were purchased by the FAO and transported to the office of the District Agricultural Coordinators, from where they were transported and distributed by the implementing NGO to the targeted beneficiaries. Monitoring of crop performance was undertaken by the implementing NGOs and MACO. Monitoring visits were carried out to assess crop performance by the FAO, EU, MACO and the implementing NGOs.

Outputs

- In the month of July 12.5 MT of low nitrogen OPV maize (ZM 421 and ZM 623) (2.5 Kg/HHs), 1.6 MT of Beans (Solwezi Rose) plus various vegetables including Amaranthus were procured and distributed to 6150 flood affected HH in all targeted districts. A further 0.8 MT of rice (variety Super) was procured and distributed to 800 affected HHs in Senanga and Mongu to restore the germplasm lost in the floods.
- 90 MT basal dressing (NPK: 20:10:20) and 60 MT of top dressing (46% Nitrogen) fertilisers were procured and distributed to 4980 affected HHs.
- An independent end of project joint FAO and PAM was undertaken to assess project impact with support from EC and Department of International Development.

5. Impact on Beneficiaries

5.1 S.A funded “Dry Season Cropping Support in Eastern, Southern and Western provinces - 2006/07”

- During 2006 and 2007, an estimated 453 Ha and 400 Ha of maize was cultivated with an overall estimated harvest of 2,430 MT of grain or green maize with an estimated cash value of US\$ 668,918 resulting in increased production and food availability to HHs.
- In 2006, beneficiary HHs who received 5 kg maize were able to produce an average of 14 x 50 Kg bags of grain maize while those who received 2.5 Kg in 2007 produced an average of 8 x 50 Kg bags of maize.
- Beneficiary HHs were estimated to raise an average of US\$ 400/HH from sales of green maize, thus increasing household income.

- Seed availability to beneficiary HHs and communities was increased due to availability of improved OPV of amaranthus, okra, tomato and beans. In Sinazongwe some of the beneficiaries have in 2008 doubled their cultivated area of okra from the seeds provided in 2006/07
- Through use of treadle pumps, beneficiary HHs increased their irrigated areas and production under dry season cropping by an estimated 0.25 Ha /HH.

5.2. E.C funded “Emergency Provision of Agricultural inputs in Western and North Western Province 2007”

- Each beneficiary was able to cultivate a minimum of 0.125 Ha with average yields of 10 x 50 kg bags of grain.
- The intervention enabled households to meet household food requirements for a period of 4 months in the deficit period thus avoiding the need for protracted food relief.
- Availability of short cycle OPV germplasm to flood affected communities in Western and North Western province ensuring access beyond project life.
- A total of 1033 beneficiary farmers in targeted districts were trained in Wetland crop production to improve their production skills.
- Increased availability of household food and dietary diversity resulting in improved nutrition for beneficiaries.
- Increased household income to meet basic needs through sale of surplus produce such as green maize and vegetables. Maize (Green maize) contributed highest (51%) towards HH income followed by vegetables (27%) and legumes 22% (Hamazaka et al, 2008).
- Increased self reliance and resilience to future shocks through access to improved OPV seeds.

6. Programme Implementation Challenges

- Crop- livestock/wildlife conflict in some areas e.g cattle, hippo and elephant destruction of crops in the Zilili gardens (recession moisture regime) in Sinazongwe and Siavonga and Mambova.
- Economies of scale in input delivery (i.e. in the short run it is uneconomical to transport low quantities of inputs for dry season cropping intervention to very remote areas). However, it is probably still justified and economical if long term sustainability issues such as use of open pollinated varieties and planting materials that can be recycled for three to four years without reduction in crop yield.
- Poor infrastructure (especially roads): - Transporters and input service providers shun delivery of inputs or purchase of produce to some remote locations due to poor road infrastructure.
- Low sense of ownership by some key stake holders under ad hoc approaches and inadequate appreciation of the need for synergetic implementation of activities among some key stakeholders.

7. Lessons Harvested

Box 1: Sentiments by DC Zambezi

Winter cropping has shown great potential. It assures households with some crop harvest during the lean period (October – February) when most areas are flooded in the middle of the rainy season and cannot easily be reached/accessed by road. Even relief food is still stuck in storage sheds as roads are impassable. If scaled up and properly implemented, wetland cultivation can help in cutting down costs of relief food distribution (Hamazakaza et al, 2008)

- There is lack of an operational framework for sustainable utilisation. Opinion is divided on the use of inorganic fertilisers and agro-chemicals among agricultural professionals/stakeholders. Visual nutrient deficiencies particularly nitrogen and phosphorus are however a common feature in the Barotse plains and the recession moisture regime of the Kariba. Pests also pose a major challenge in vegetable crops. Soil fertility enhancing technologies such as green/organic manures and Integrated Pest Management (IPM) options should be promoted taking into account existing farming systems. The case of Ms Meebelo from Sefula in Mongu is an example of how green manures can be harnessed to increase productivity.
- Wetland farming systems are being eroded by the impact of frequent climatic shocks (drought in 2004/05, floods in 2006/07) and external assistance programmes. In Zambezi for example, many farmers indicated that they have become dependant on external assistance programmes for seed following the loss of their local germplasm due to frequent floods. There is need to increase awareness and build capacity in the affected communities to respond and adapt to climatic changes; provision of timely information on weather forecasts to communities, promoting appropriate water management and harvesting technologies as well as reviewing options for better local access to seed.
- Farmers have indigenous knowledge on utilisation of wetlands for food production, however, many farmers expressed limited knowledge on alternative soil fertility enhancing techniques such as use of organic/green manures. Monocropping and trash burning are a common feature among most farmers. In Zambezi and Chavuma districts, farmers did not apply livestock manures even when they had access to it and nitrogen deficiency was common. Farmers and extension staff need to be re-trained on sustainable cropping options such as Conservation Agriculture. In Mongu's Malengwa area, a farmer who had been applying Conservation agriculture techniques for Maize and vegetable production proved the success of the technology under wetland conditions.
- There was higher demand for dry season cropping input support at community level than the project estimation based on VAC figures. This could either be attributed to; under estimation of target numbers, or existence of a large number of households suffering chronic food vulnerability not necessarily related to the effect of floods. Furthermore, some communities which were not covered during the VAC assessment (due to inaccessibility) later requested assistance as well. The 2008, VAC in depth Report states that

although only 10.9 % of people interviewed practiced dry season cropping, 75% of respondents indicated that they would like to engage in the activity this season (VAC, 2008). Lack of inputs, labour and inadequate production knowledge/ extension support services were cited as major constraints to increased use of wetlands for cropping.

- Labour, annual and seasonal water variability have been cited to be among major constraints to increasing the area cultivated by HHs. In some areas there may be need to support ecologically friendly water capture devices.
- Inputs for dry season cropping need to reach the farmers early (March/April) in order for them to maximize on the usage of their land in time and space. This is of cardinal importance with respect to available labour and crop access to residual moisture.
- It is important for stakeholders especially the Ministry of Agriculture to facilitate a steady transformation of the extension approach from that which emphasizes on rain fed agriculture to placing of equal emphasis on dry season cropping in the wetlands.

8. Conclusions

- Dry season cropping offers real opportunities for vulnerable HHs not only to increase and diversify their production, but also to jumpstart themselves from a life of mere subsistence production to real wealth creation and restoration. Pressure is likely to increase for wetland usage to meet agricultural needs, especially with climatic shocks and rising input and food prices. There is need to formulate the relevant policy and institutional framework to unlock the potential in the wetlands while preserving the ecology and prevailing farming systems. MACO should always be involved in promoting wetland cropping in order to ensure institutionalization of the activity as a routine cropping activity requiring the ministry's attention in a similar manner to main season cropping.
- The process of developing and activating the relevant wetland preservation and utilisation framework should ensure inclusiveness by all stakeholders. Relevant government line ministries such as the MACO, Ministry of Natural Resources and Tourism should take a pivotal role in spearheading the process with adequate support from other interest groups
- There is also a need to allocate resources to improve road infrastructure to wetland areas in order to stimulate private and public sector service provision, thus making the cropping interventions more sustainable.

References

Owen R, Verbeek. K, Jackson. J and Steenhuis.T.1995 (editor). Dambo Farming in Zimbabwe.Water Management, Cropping and Soil Potential for Smallholder Farming in Wetlands. Conference Proceedings. University of Zambabwe.

Kokwe .M (editor). 1993. Sustainable use of Dambos in Southern Africa. International Institute for Environment and Development and the Department of Agriculture. Proceedings of the Regional Policy Workshop, Lusaka, Zambia, January 1993.

Vulnerability Assessment Committee. 2008. In depth Vulnerability Assessment Committee report, Disaster Management and Mitigation Committee (DMMU). Lusaka, Zambia.

Hamazakaza P. Syamkwilimba I.S.K, Kauseni .and Mutinta A. 2008. “Lessons for the Process of Winter Cropping Design and Implementation in Floods Mitigation”. Independent Assessment on the of the Implementation of the Department for International Development and European Commission supported Winter Cropping Interventions in Central, Northern, Western and North Western Provinces of Zambia. FAO, Zambia.

Sutcliffe P.2007. Wetlands livelihoods in Western Province. Concern Worldwide and Oxfam. Wetland Action. Amsterdam, the Netherlands.

4. Questions and Discussion

4.1 Session 1: Dambo Utilisation

Question

How are the different projects addressing the use of pesticides, especially managing their adverse impacts on biodiversity? For example in Kenya we have a big challenge because of the use of Furadan on farms, because it is killing a lot of wild animals (birds and mammals). –*Violet Matiru, Wetlands International - Demonstration Projects Technical Group, Kenya*

Responses

We have used the integrated pest management (IPM) concept to control pests and diseases by adjusting the time of planting to the vulnerability of the crop being attacked. The season when the crop is likely to be attacked and that season is avoided, or skipped. There is also the aspect of use of local herbs to control pests, such as Tephrosia, including the use of Chilis in some cases to control aphids. The use of appropriate crop rotations have also been applied – *Bupe Jonas Sampa, NLWCCDP, Zambia*

Further it is observed that pesticide use is limited in Zambia and thus does not pose a serious problem. However, biological control systems including integrated pest and disease control in dambo cropping is sustainable and feasible but at some point farmers are forced to use chemicals. To avoid detrimental effects such as poisoning of aquatic life and birds in wetlands, we need to strengthen training of farmers in the

judicious use of chemicals. Care must be taken that chemicals on 'Banned list' are not used and those that lose potency when in contact with the soil are encouraged to avoid them getting into the subsurface flow of groundwater into streams where water life and humans would be in danger –*Angel E. Daka, COMESA Food and Nutrition Security Advisor, Zambia.*

And pest problems pose a major challenge to wetland cropping in most parts of the Barotse flood plain and other areas. This has to be taken into account in any intervention. The country's plant protection service is rather weak, an aspect aggravated by inadequate legislation for regulating pesticide trade and usage – *Albert Mate, Concern Worldwide, Mongu, Zambia.*

IPM, especially biological control is used by promoting natural vegetation in areas which will harbour predators for the pest –*Patrick Thawe, MALEZA, Malawi.*

In Luapula, Zambia, the environmental consultant that PLARD engaged brought out pesticide use as a very serious concern. Depending on the level of production, the farmers with higher production levels were found to use a lot of chemicals, with a number of them being the restricted ones. Similarly, the agro-chemical stockists in the province were found stocking some restricted, or banned chemicals. *Alfred Mkonda –PLARD, Zambia*

Question

How do we handle the issue of burning organic matter during land preparation in the dambos as explained in the Mpika case? Take for instance in PLARD situation where you are told by an environment consultant not to encourage burning during land preparation especially when funding for the project is coming from a country which is a signatory to the Kyoto Protocol, but on the other hand we have been told by the North Luangwa Project that if you do not burn you get zero yield. So how do we strike a balance? *Alfred Mkonda, PLARD.*

Responses

Dangers of burning are very minimal. Burning is done only for a small stretch of a ridge and the place being burnt has a lot of ground water making sure that the burn cannot spread. However, striking a balance in overall wetland land use is important. - *Bupe Jonas Sampa, NLWCCDP, Zambia*

Limited burning should be encouraged as opposed to wholesale burning of dambos that have accumulated high organic matter with soils that are referred to as histosols. *Angel E. Daka, COMESA Food and Nutrition Security Advisor, Zambia.*

In wetland use and suitability, it was noted that from a farmer's view point, burning was more efficient than burying. – *Misael Kokwe, FAO Zambia*

Burning of grass and other organic matter helps to release Potassium. This fixes the sulphates and chlorides from sulfuric acid and hydrochloric acid, and hence helps the soils reduce the prevalence of acidic conditions that are detrimental to many crops. An overall effect is that a wider range of crops can be grown under less acidic conditions. However, burning should be practiced cautiously as the destruction of soil organic matter is not a good practice for maintenance of desirable soil conditions in soil fertility management. -*Dr Angel E. Daka, COMESA, Zambia*

Question

PAM made reference to limited application of fertilizer and herbicides, could you clarify what constitutes 'limited'?- *Tadeyo Shaba, Self Help Africa, Zambia.*

Responses

Fertilizer is provided to beneficiaries at half the normal rate for upland fields to limit chemical leaching into the soil and ground water. The fertilizer used is only a starter to boost plant growth. Currently PAM is discouraging fertilizer use on wetlands - *Paul Kapotwe, PAM, Zambia*

On the other hand, it is recommended in Zambia that only limited use of fertilizer is needed in dambos for sustainable use of these environments since dambos act as buffers which accumulate nutrients that come with run-off from the high grounds (uplands) that surround wetlands (dambos). Farmers plough in organic matter which once decomposed adds to soil fertility. With this practice some farmers have produced high yields without any application of fertilizer. The latter is also true for dambo users in countries like Burundi and Rwanda. We need to strengthen and encourage soil testing before these environments are used for crop production entailing fertilizer use. *Angel E. Daka, COMESA Food and Nutrition Security Advisor, Zambia.*

Question

Wetlands as a 'common good'. What issues did you experience related to land tenure? And how is the land tenure issue managed within the functional landscape approach? - *Unnamed observer.*

Response

Participatory approaches are used to identify leadership arrangements within the community to address issues like who owns what land, and who has the powers to distribute it. This right is restricted in a particular community. When starting a VNRMC leadership roles should be attributed to those whose responsibility is to carry out the whole wetlands concept. Capacity building is enhanced and should be executed and be seen as a natural process and a rule in the functional landscape approach. -*Harold Msusa, MALEZA, Malawi*

Question

To what extent do the targeted "vulnerable but viable" community members influence the sustainable wetland usage when "vulnerable and not viable" are left out? *Jeremiah Mbewe –Action Aid, Zambia*

Response

In the process of targeting those that are “vulnerable but viable” a viability assessment is conducted through criteria based on availability of skills, availability of land and social capital (social safety), and the existence of strong traditional systems through which local rules and regulations are enforced. This is so as to provide a vehicle to influence issues of common good. -*Albert Mate, Concern Worldwide, Mongu, Zambia*

Question

Were samples of tissue taken from birds, fish, plants, etc, for analysis for chemical contamination? *Dr N.Nyambe –WWF, Zambia*

Answer

This has not been done as far as is known.

Question

Is there any possibility of linking VNRMCs to Area Development Committees (ADC) to give them the legal mandate and legitimacy to enforce by-laws for sustainable utilization of wetlands? And further, how would you identify NGOs and others involved in wetlands to help get a wider input into the reviews of the National Wetlands Policy? -*Enerst Chupa, NLWCCDP, Zambia.*

Response

Institutional operations are made within the community and by-laws developed to look at catchments and dambo management at the village level. This will link the VNRMC and the ADCs.

4.2 Session 2: Policy

There was recognition of the National Wetlands Committee in Zambia, and that a national policy discussion had gone on for a long time, with ZAWA as the current focal point organization within the Ministry of Tourism, Environment and Natural Resources.

Further questions were raised as to which Ministry should take the leading role in formulating the National Wetlands Policy in the country.

Questions

For sustainable use of wetlands, how do we strike a balance between ecological use, social aspects and economic development of the wetlands? There is need to come up with a balance. -*Charity N. Mundia, Environment Council of Zambia (ECZ), Zambia.*

Are there any guidelines to make the best use of the dambos as there are a diversity of crops cultivated and livelihood activities undertaken? –*Violet MATIRU, WI-DPTG, Kenya.*

Responses

Many countries are in the same situation as Zambia with drafts of the Wetland Policy. In recent times, Ministries responsible for Water, Agriculture, Irrigation, etc. have all expressed interest in wetlands. Formally, wetlands were considered the preserve of nature conventions, but now the situation has changed. The Kenyan example in which ‘Wetlands Associations’ are to be the formal legal consultative groups for community matters on wetlands is one example of a draft policy currently being developed, which may be of wider relevance. –*Mike Ounsted, WI-DPTG, UK.*

Initially in a case of Kenya, the Kenya Wildlife Services was spearheading the development of a Wetlands Policy. However, currently this policy is seen as belonging more within the National Environmental Management Authority (NEMA), which has a co-ordination role. Due to the multiple roles played by wetlands, touching on various sectors (Wildlife, Agriculture, Water, Irrigation), the Wetlands Policy should be hosted by an organization that can co-ordinate wetland use and management. –*Violet MATIRU, WI-DPTG, Kenya*

Co-ordination by stakeholders advocating use of wetlands should be the approach as FAO has done. FAO’s work should be subjected to the PLARD economic modelling. We also need to lay emphasis on watershed management as this has implications for dambo survival. Guidelines on the use of wetlands should be developed under the Global Environmental Fund Project, and built on experience, as in the Lukanga Swamps where activities are being implemented by ZAWA, and the experience gained by IWMI in eastern and southern Africa. –*Dr Angel E. Daka, COMESA, Zambia*

The idea of stakeholders networking is very welcome. The plan was to revive the National Wetlands Steering Committee first, then move on with the guidance of the committee to engage other stakeholders. There is also a concern about poor information documentation, as an example, the Lukanga Swamps may be a case in reference. –*Dr N.Nyambe, WWF Zambia*

There is need to recognize the value and importance of wetlands for health in the provision of critical nutrients through the vegetable production. –*Dr Mick Mwala, UNZA Zambia*

Crop suitability maps have been used to give guidance in wetlands use, and the suitability for certain crops. It was unfortunate that in the Western Province of Zambia, these were discarded as may be seen in the emphasis in the promotion of maize cultivation where the crop is not suitable. *Mate, CONERN WORLDWIDE Zambia*

Comments

There is need for NGOs to network because there is a danger of duplication of effort by organizations involved. So, there should be a way of interactions to avoid this duplication as is seems to be the case in the Katuba area of Chibombo District of Zambia. –*Alick G. Mbewe, Department of Fisheries (DOF), Ministry of Agriculture and Fisheries, Zambia*

We have raised a lot of expectations amongst the wetlands communities. They are tired of research programmes whose results do not go back to them. –*Jonathan Chisaka, PELUM Zambia*

5. Report back by Group Work

5.1 Experiences and lessons on wetland utilisation and conservation

- a. Do wetlands have any future in Zambia? What is the future we can envisage for wetlands in Zambia? Will it be the same for all of them?
- b. Between utilization and conservation, where are most efforts spent at present? How should this balance be adjusted in the future? (Of course sustainable use is the best bet)
- c. To what extent are catchment activities affecting wetlands and vice versa?
- d. What threats (social, economic, ecological) do wetlands face in Zambia?
- e. What are we doing to reduce threats to wetlands?
- f. What issues / problems need to be addressed to reduce threats to wetlands?

Group One Presentation

Group One acknowledged that wetlands have a future in Zambia as long as they are utilised under sustainable principles and the use is controlled. In this respect they will continue to provide hydrological, livelihoods and ecological benefits to humanity. It was noted that wetlands value and utilisation will differ from wetland to wetland, and some will diminish faster than others, if heavily used. Different wetlands will support different ecological functioning / livelihood use balances due to differing utilisation benefits and ecological characteristics, and some wetlands can be sustained longer only if they are managed under effective regulations and systems.

Regarding utilization and conservation more emphasis has been placed on utilization rather than conservation in this meeting. It was noted that more players are engaged in providing interventions for livelihoods benefits with little wetland conservation awareness being done, emphasising communities' access to wetlands for livelihoods benefits only ignoring the balance in conservation and utilisation. In the future the balance should be maintained to ensure awareness on conservation of wetlands, and the regulation of the activities to be executed. Awareness on effects of poor wetland utilisation and management need should be spelt out along with the sustainable utilisation aspects, which are needed together with remedial practices and clear, specific utilization regulations.

As to what extent catchments area activities affect wetlands and vice versa, the group concluded that catchments areas and wetlands affect each other. For

instance, by accessing timber to support fish drying on wetlands, fish camps deplete the forests of catchments areas through harvesting of fuel wood. Eco-tourism affects wetlands by building camps and chalets, boating, and so on. Further, the migration of people from upland to wetlands can have devastating effects on wetlands. In certain circumstances there is migration of communities to wetlands when uplands dry out due to droughts. The building of new homes can impact on these resources, leading to over population due to logging of the woodlands for construction, as can energy power generation, industrial plantations, like sugar estates, housing plans, river sand mining and so on.

With regards to threats (social, economical, ecological) wetlands face in Zambia, the social ones include population pressure, over-utilisation of wetlands, uncertainty of ownership, ineffective access and control of wetlands, and traditional tenure systems. Key economic ones include industrial expansion, for instance, sugar production, mining, informally referred as the ‘spirit-of-the-river bio fuel diversity’, fishing, boating and eco-tourism activities. The ecological aspects include depletion of the bio-diversity of wetlands, depletion of aqua life, and climate change.

In terms of reducing threats affecting wetlands, it was observed that not much is presently being done, and sadly, we have promoted utilisation at the expense of wetland conservation. It was noted that as much as wetland awareness is going on, it is inadequate. Further, the wetland utilisation and conservation farming practices should be enhanced by developing advocacy on the wetland management policy. Still, there is not enough guidance on integrated pest management and land use planning which can be applied to wetlands.

In conclusion, the problems that need to be addressed include:

- undertaking capacity building on wetland management and conservation, and
- the formulation of coherent policies to regulate and legislate wetland utilisation.

There is a need to engage in active advocacy, campaigning and lobbying for improved wetland management. There should be establishment of a wetland working group to coordinate wetland activities in Zambia. There must be the expansion of wetland awareness and conservation activities from the local level to the national level through effective partnerships and key stakeholder identifications, so as to inculcate integrated management in such areas, including land use planning, forestry, environment, water and soils. The table below indicates some key stakeholders with potential roles to play.

Key Stakeholders in Wetland Management in Zambia

PLAYER	ROLE
MACO	develop policies on wetland cultivation, integrated pest management, monitor wetland utilization
CSOs	advocate for wetland policy that supports utilization and conservation, budget tracking, civic awareness

	etc
INDUSTRY	observe wetland regulations, involve partners in industrial planning
COMMUNITY	observe guidelines and wetland utilisation polices, practice sustainable approaches in utilizing wetlands
DONOR COMMUNITY	promote balance between wetland utilization funding and conservation funding

The roles of stakeholders may include the following:

- MACO – Irrigation, agriculture, lands use, crop, soils research and extension
- WWF – Bio-diversity, conservation, research development, and monitoring
- NGOs (PAM, NLCCDCP FAO etc,) – Harmonised wetland approaches, Monitoring, Evaluation, wetland and coordination
- ZESCO –Power generation
- HERITAGE COMMISSION – Heritage site protection
- MTENR – ZAWA, ECZ – Environmental regulation, monitoring, wildlife and tourism support
- Communities – Sustainable livelihoods benefits
- Researcher role - to undertake inventories of the resources and unpack wetlands across water, soil, utilisation, record inherent potentials, and livestock with crop shares in terms of global lessons to balance the activities.

5.2 Technical requirements for wetland management

- a. What technical advice and support is available to achieve a balance between utilization and conservation of wetlands?
- b. What technical advice and support do we need to achieve a balance between utilization and conservation of wetlands?
- c. What opportunities are there to promote a balance between utilization and conservation of wetlands in Zambia? Any examples?
- d. To what level are traditional methods integrated with modern methods in wetlands utilization and conservation?
- e. To what level are communities, extension workers, programme managers and decision makers aware of the need to maintain a balance between utilization and conservation of wetlands?

Group Two Presentation

Group Two discussed issues relating to technical requirements for wetland management. In the discussion it was noted that technical advice and support is needed to achieve a balance between utilization and conservation of wetlands. This

guide should focus on a Functional Landscape and Sustainable Wetland Utilization and could be developed via an FAO consultancy building on existing material. Technical support required includes harnessing the work from various key stakeholders, for instance, PAM, NLWCCPD, IDE, WWF, PLARD and CONWCDP. This is a need for adaptive research and evaluation in wetland use.

In addition to the technical advice and support needed in order to achieve a balance between utilization and conservation of wetlands, there is a need for a policy to guide wetland use in Zambia. To support this, studies should also be undertaken to help make informed decisions on the utilization of different types of wetlands (a guideline on development for striking a balance on utilization and management/conservation). There should be on-going monitoring and evaluation (M&E) on wetlands utilization. There is also need for judicious hydrological management, determination of carrying capacity of the wetlands and soil fertility status. Furthermore, documentation of historical records of use and management, as well as conservation measures and the views and experience of wetland users should be encouraged, whilst existing/fragmented research on wetland uses and experimental recommendations should be gathered together and publicized in a more co-ordinated manner than what obtains presently.

Opportunities to promote a balance between utilization and conservation of wetlands in Zambia include the fact that; there is plenty of water available in *dambos*. Further, the communities in wetland areas are responsive to balanced utilisation of these resources through their local social structures. The existence of organizations already working in areas of wetland utilization and management provide added valuable opportunities. Local knowledge is also readily available.

Such an initiative to build on technical experience to date is timely because there are a pressing needs resulting from climate change factors and land degradation. It is expected that there will be increasingly prolonged and frequent conditions of drought which will lead to low agricultural productivity and increasing food prices. Other pressures encouraging the development of wetland technical measures include the realization of the impact of over exploiting of wetlands by wetland users, and the decline in production and livelihood benefits.

The level of integration between the traditional methods and modern methods in wetland utilization and conservation were reported as low. This follows the fact that, there are weak interactions between indigenous knowledge (*IK* - traditional) and modern approaches in wetland use and conservation. Besides, it was reported that people tended to have adopted colonial guidelines in which *dambos* were classified as unsuitable for arable crop production, ignoring local indigenous knowledge (*IK*).

It was evident from the discussion that communities, extension workers, programme managers and decision makers are to a certain extent aware of the need to maintain a balance between utilization and conservation of wetlands. It came out that communities are at least aware, while extension workers are aware but weak when it comes to implementation. Programme managers are aware but lack strategy and

co-ordination to develop effective and efficient action plans to implement. Similarly, policy makers are aware but have a low realization of the importance of wetlands, while on the other hand donors are very aware of these pressing needs.

Availability of development partners such as FAO and WWF who are cognizant of sustainable use and conservation needs for wetlands, as an exemplified in the RAMSAR sites.

5.3 Policy related issues

- a. Do we need to develop a policy on wetlands in Zambia?
- b. b) Which agencies – government and civil society, have interests in wetlands and for what purpose / reasons do they have these interests.
- c. If yes to (a), what should the policy focus on? How can that policy include the interests of all the different agencies with interests in wetlands?
- d. To what extent do various policies pay attention to issues on wetlands in Zambia?
- e. What problems have been faced in developing a dialogue on wetland policies?
- f. How can those challenges be faced and what is the way forward for wetland policy development?

Group Three Presentation

Group Three discussed policy related issues. It was evident that there is need to develop a policy on wetlands in Zambia, and this was long over due. There are a number of agencies – government and civil society, with vested interests in wetlands.

The table below outlines some of the agencies and their interests.

Agency	Interest
Ministry of Tourism, Environment and Natural Resources (MTENR)	<ul style="list-style-type: none"> • Sustainable utilization • Eco-tourism • Biodiversity • Habitat preservation
Ministry of Agriculture and Cooperatives (MACO)	<ul style="list-style-type: none"> • Food security (availability, access, nutrition) • Biodiversity • Livelihoods
Ministry of Energy and Water Development (MEWD)	<ul style="list-style-type: none"> • Energy generation • Water use rights

Ministry of Community Development and Social Services (MCDSS)	<ul style="list-style-type: none"> • Poverty reduction
Ministry of Health (MoH)	<ul style="list-style-type: none"> • Source for Vitamin A • Malaria control
Ministry of Lands (MoL)	<ul style="list-style-type: none"> • Land tenure
Traditional Authority	<ul style="list-style-type: none"> • Customary rights, access use, livelihoods
Civil Society	<ul style="list-style-type: none"> • Livelihoods • Poverty reduction • Conservation

The policy to be developed should focus on sustainable use and should strike a balance between utilization and conservation. It must also focus on stakeholders' interests and take a participatory and consultative approach. It should be noted here, that the various existing policies in Zambia pay only marginal and rudimentary attention to wetlands and little or nothing is said on wetlands issues. Besides, a number of problems have been faced in developing a dialogue on wetland policies. The problems include; institutional feuds, unclear leadership, uncoordinated players (i.e. there are too many players with no guided direction), failure to adopt and address stakeholder consensus based on consultations, and inadequate funding. However, these challenges can be faced by influencing engagements and increasing dialogue with ZAWA who are presently the policy drivers.

5.4 Network on wetlands

- a. Who are the main role players and stakeholders in wetland management in Zambia and what are their interests?
- b. What role is civil society playing in wetland management?
- c. What role are communities playing in wetland management?
- d. What role is government playing in wetland management?
- e. What is the role of research in wetland management?
- f. How can we develop a way in which we can co-ordinate wetland utilization and conservation in Zambia? Who should have what responsibilities?

Networking on wetlands was discussed by all groups. For Group Two this came out clearly as the main tasks for players and stakeholders in wetland management in Zambia. Such actors include agencies of the Government of the Republic of Zambia (GRZ), local communities (traditional leaders and local institutions), NGOs, the private sector, and multi-laterals such as FAO, USAID, JICA, NORAD, etc. The role of the Civil Society in wetland management include; ensuring food security and better livelihoods, capacity building and efficient products and services provision, such as

inputs etc. It was highlighted that the role of communities in wetland management is to institute local by-laws relating to grazing, harvesting of reeds, and tenure rights, among others, while the role of the Government is to controlling and regulating the use of wetlands as well as sensitizing and training people on wetland use. It was further highlighted that research plays a role in investigating good and bad practices, and the provision of remedies for appropriate use.

To develop a way in which to co-ordinate wetland utilization and conservation in Zambia, the Group resolved that there is need to have a database compilation centre for organizations to systematically support the sustainable use and conservation of wetlands as part of an effective approach for development. Stakeholder analysis before promoting any wetland intervention is essential.

In order to have to have a better co-ordination on wetland utilization and conservation in Zambia, the following systematic approach should be undertaken:

1. Policy be put in place
2. Research be conducted
3. Management plans be developed
4. Extension education be carried out
5. Documentation of experiences on wetlands be accomplished
6. Co-ordination of action plans and players is crucial
7. Monitoring and Evaluation (M&E) system should be in place
8. Participation/Advocacy of all stake holders
9. Financial Resources Mobilization is critical
10. Cross-cutting issues (HIV/AIDS, Gender, DRPM) should never be overlooked

Further, Group Three went on to discuss networking on wetlands, and the main players and stake holders in wetland management were said to be the agencies outlined in the table above. The role of civil society in wetland management was said to be training and capacity building, lobbying and advocating for funds as well as resource mobilization. Communities in this regard play custodial responsibilities. The Government's role is on policy guidance and enforcement while the role of research in wetland management is to develop, transfer and disseminate technologies.

It was further highlighted that a way in which to co-ordinate wetland utilization and conservation in Zambia can only be developed through promotion of community practices, and allocation of responsibility amongst stakeholders based on competitiveness and comparative advantage.

6. Outputs and Next Steps

Outputs from the meeting would include:

3. A lessons learning report of experiences with wetland utilisation from those actors present at the meeting and the review of experiences and lessons, leading to recommendations for future actions, specifically in:
 - a. Identification of technical areas where actors may require additional support and inputs and exploration of potential ways to achieve this; sharing existing standards and models and good practice both in relation to processes (at different levels – community, local / regional and national levels)
 - b. Identification of policy related issues which may require further consideration in order to explore *how policy development can assist achieve sustainable wetland management*; and
4. Consideration of the establishment of regular exchange of experiences and ideas through an informal network of interested parties.

CONTACT DETAILS OF PARTICIPANTS

Name	Organisation	Contact Email
Enerst Cheepa	NLWCCDP	chibanjecheepa@yahoo.co.uk
Jonas Sampa	NLWCCDP	jonasampa@yahoo.com
Alfred Mukonda	PLARD	aco@plardzambia.org
Paul Kapotwe	PAM	kapotwep@yahoo.com
Albert Mate	Concern	mate2albert@yahoo.com
Kenneth Chelemu	IDE	chelemuk@idezambia.org.zm cc. mukambae@idezambia.org.zm
Misheck Laibuta	Oxfam	milaibuta@oxfam.org.zm
Jonathan Ckisaka	PELUM	ibaluka2007@yahoo.com cc. pelum@coppernet.zm
Tadeyo Shaaba	Self Help Africa	tadeyo@selfhelpafrica.org.zm
Geofrey Kayama	Self Help Africa	geofrey@selfhelpafrica.org.zm
Chisomo Phiri	Self Help Africa	chisomo@selfhelpafrica.org.zm
Jeremiah Mbewe	Action Aid	
John Mushimuko	Keepers Zambia Foundation	
Conrad Muyaule	CRS	cmuyaule@zm.saro.crs.org
Mukelebai Ndiyoi	FASAZ	liowanyi1892@yahoo.com cc. fasaz@zamnet.zm
Mike Muleba	FOSUP	mmuleba@yahoo.co.uk
Angel Daka	COMESA	adaka@comesa.int
Adrian Wood	Wetland Action	a.p.wood@hud.ac.uk
Angela Kabuswe	Ministry of Tourism	
Allan Dauchi	Min of Tourism & Envi	
George Sikuleka	Ministry of Agriculture	
Alan Dixon	Wetland Action	a.dixon@worc.ac.uk
Mike Ounsted	WI Advisory	mike@ounsted.plus.com
Violet Matiru	WI Advisory	violet.matiru@gmail.com
Dr. N. Nyambe	WWF	nyambe@yahoo.com
Voice Vingo	OPAD	voicevingo@yahoo.co.uk
Micky Mwala	UNZA	
Patrick Thawe	MALEZA	thawepatrick@yahoo.com
Harold Msusa	MALEZA	hmsusa@malezamw.org

Invitees not attending

- | | |
|----------------------|-------|
| 1. Richard Chintu | PELUM |
| 2. Stephen Mukumbuta | PLAN |
| 3. Samuel Tembo | PLAN |
| 4. Chansa W | ZAWA |
| 5. Chuma Simukonda | ZAWA |
| 6. Mosho Imakando | Norad |
| 7. Dora Kamwenesha | WWF |
| 8. Charles Nkhoma | WWF |

9. xx
10. xx

Environmental Council
World Vision